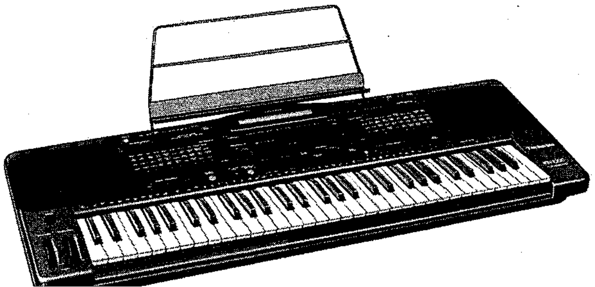
ORDER NO. EMID911337 5
A5

Service Manual

PCM Keyboard
SX-KN1000

(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW),
(EA), (EP), (EK), (XL), (XR), (XS), (XD), (X)



AREAS

(M):	U.S.A.	(EK):	the United Kingdom
(MC):	Canada	(XL):	New Zealand
(XM):	Mexico	(XR):	Australia
(EN):	Norway, Sweden, Denmark, Finland	(XS):	Malaysia, Singapore, South Africa
(EH):	Holland	(XD):	Saudi Arabia, Kuwait
(EF):	France, Italy, Belgium	(X):	the Middle East, Indonesia, Hong Kong, the Philippines, Thailand, Taiwan
(EZ):	Germany		
(EW):	Switzerland		
(EA):	Austria		
(EP):	Spain, Portugal, Greece		

Specifications

KEYBOARD			61 KEYS (TOUCH SENSITIVE KEYBOARD)
SOUND GENERATOR			PCM
MAXIMUM NUMBER OF NOTES PRODUCED SIMULTANEOUSLY			32 NOTES (A MAXIMUM OF 8 SIMULTANEOUSLY PRESSED KEYS CAN BE INPUT)
SOUNDS	PRESET	POLY 1, POLY 2, BASS	120 SOUNDS (40 SOUNDS × 3 VARIATIONS) PIANO 1, 2, E GRAND, E PIANO 1, 2, HARPSICHORD, MALLET 1, 2, AFRICAN PERC, ORIENTAL PERC, GUITAR, JAZZ GUITAR, SOLID GUITAR, ROCK GUITAR, SPECIAL PERC, PIPE ORGAN, JAZZ ORGAN, POP ORGAN, VIOLIN, STRINGS, BRASS, TRUMPET, TROMBONE, SYNTH BRASS 1, 2, SYNTH PERC, SYNTH LEAD 1, 2, SYNTH ENSEMBLE 1, 2, SAX, CLARINET, REED, ACCORDION, FLUTE, PAN FLUTE, ACOUSTIC BASS, ELECTRIC BASS, CHOPPER BASS, SYNTH BASS
	EDIT	BASIC	TONE, PITCH, ENVELOPE, VIBRATO, TOUCH SENSE, MEMORY WRITE & NAME SET
		EFFECT	DIGITAL EFFECT, AUTOBEND & TRILL, MODULATION, OTHERS, MEMORY WRITE & NAME SET
		SOUND MEMORY	10 × 3 MEMORY
BACKGROUND SOUND			14 SOUNDS (7 SOUNDS × 2 VARIATIONS) BIRD, BEACH, CHURCH BELL, CITY, APPLAUSE, EXPLOSION, SPACE, FADE OUT
EFFECT			DIGITAL EFFECT, SUSTAIN, DIGITAL REVERB, PITCH BEND WHEEL, MODULATION WHEEL
RHYTHM	RHYTHM SELECT		120 PATTERNS (40 PATTERNS × 3 VARIATIONS) MARCH 1, 2, POLKA, COUNTRY 1, 2, WALTZ 1, 2, TANGO, RHUMBA, MAMBO, BIG BAND 1, 2, JAZZ COMBO, JAZZ BALLAD, MODERN JAZZ, DIXIE, JAZZ WALTZ, BOSSA NOVA, MODERN BOSSA, SAMBA, 8 BEAT 1, 2, 3, HARD ROCK, ROCK 'N' ROLL, SHUFFLE, ROCK BALLAD, SAMBA ROCK, LATIN ROCK, MODERN LATIN, 16 BEAT 1, 2, 3, JAZZ ROCK 1, 2, SWING ROCK, FUNK, ELECTRO POP, DISCO 1, 2
	CONTROLS		START/STOP, SYNCHRO & BREAK, INTRO & ENDING, FILL IN 1, 2, COUNT INTRO, TEMPO
	MANUAL PERCUSSION		PAD 1, 2, 3
	KEYBOARD PERCUSSION		48 KEYS
AUTO PLAY CHORD			AUTO PLAY CHORD (ONE FINGER, FINGERED, MEMORY), DYNAMIC ACCOMP ONE TOUCH PLAY, MUSIC STYLE ARRANGER
TECHNI-CHORD			○
PANEL MEMORY			SET, 1~8
COMPOSER			5 TRACKS (PARTS: BASS, ACCOMP 1, ACCOMP 2, ACCOMP 3, DRUMS) MEMORY: 1~10 STORAGE CAPACITY: APPROX. 2400 NOTES INPUT MODES: REALTIME, STEP EDIT FUNCTIONS: COPY, RECORD CHORD SETTING
SEQUENCER			8 TRACKS (PARTS: POLY 1, POLY 2, BASS, ACCOMP 1/CHORD, ACCOMP 2, ACCOMP 3, DRUMS, CONTROL) STORAGE CAPACITY: APPROX. 4900 NOTES (EXPANDED: APPROX. 6600 NOTES) INPUT MODES: REALTIME, STEP EDIT FUNCTIONS: SONG CLEAR, TRACK CLEAR, VELOCITY CHANGE, QUANTIZE, TRACK MERGE, MEASURE DELETE, MEASURE ERASE, MEASURE INSERT, MEASURE COPY
DISPLAY			MUSICAL DIRECTOR: LIQUID CRYSTAL DISPLAY (40 CHARACTERS × 2 LINES), CONTRAST
DEMO			○

Technics

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MIDI	PART INDEPENDENT: BASIC CHANNEL, CONTROL MESSAGE 1, 2, IN/OUT CONTROL, PANEL MEMORY PROGRAM CHANGE CONTROL, EXPRESSION CONTROL, INTRO•FILL IN•ENDING CONTROL, APC CONTROL PART COMMON: REALTIME SETTING, COMMON SETTING 1, 2, INPUT SELECT, OUTPUT SELECT, MIDI DRUM TYPE SETTING, PANEL MEMORY OUTPUT CONTROL
CONTROLS	CONDUCTOR (POLY 1, POLY 2, BASS), BALANCE, TEMPO/PROGRAM DIAL, MENU, PAGE, TRANSPOSE, SPLIT POINT
EXTERNAL MEMORY	DIGITAL DISK RECORDER (SY-FD20, OPTIONAL)
TERMINALS	HEADPHONE TERMINAL, LINE OUT (R/R+L, L), AUX IN (R/R+L, L), MIDI (IN, OUT, THRU), FOOT SWITCH, FOOT CONTROLLER
OTHERS	POWER SWITCH, MAIN VOLUME
OUTPUT	10 W x 2
SPEAKERS	12 cm x 2, 6.5 cm x 2
POWER REQUIREMENT	100 W, 70 W (NORTH AMERICA AND MEXICO)
	AC 120/220/240 V 50/60 Hz AC 120 V 60 Hz (NORTH AMERICA AND MEXICO) AC 230 V 50/60 Hz (EUROPE EXCEPT FOR UNITED KINGDOM)
DIMENSIONS (WxHxD)	103.2 cm x 14.0 cm x 37.5 cm (40-5/8" x 5-1/2" x 14-3/4")
NET WEIGHT	10.5 kg (23.1 lbs.)
ACCESSORIES	MUSIC STAND, AC CORD

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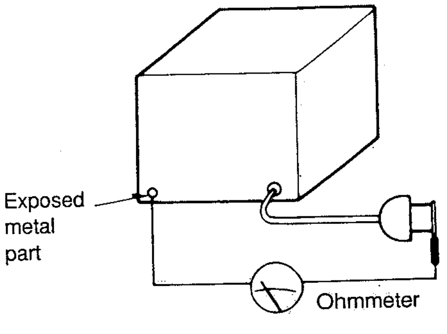
SAFETY PRECAUTION (This "safety precaution" is for the U.S.A. only)

• Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

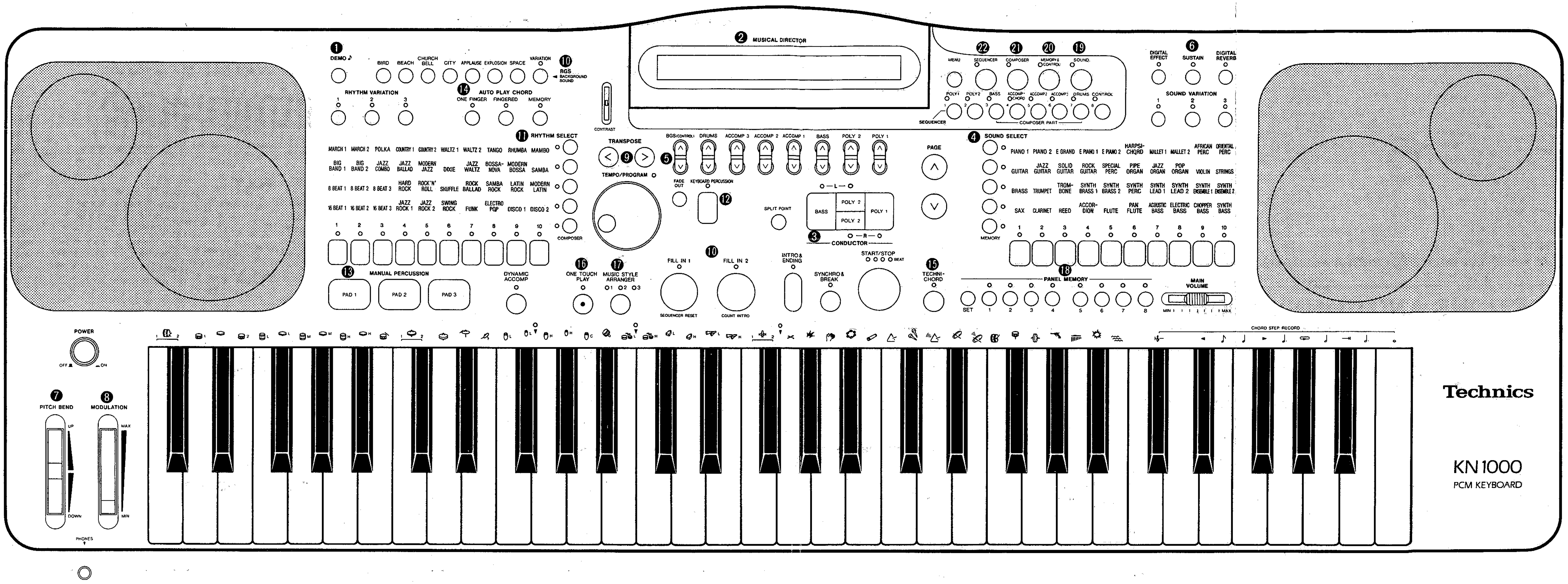
• Insulation Resistance Test

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc. Measurements should range from 4 MΩ to infinity for all exposed parts.



Resistance=4 MΩ to ∞

ARRANGEMENT OF CONTROL PANEL



DEMO ♪
BIRD
BEACH
CHURCH BELL
CITY
APPLAUSE
EXPLOSION
SPACE
VARIATION
BGS BACKGROUND SOUND
RHYTHM VARIATION
AUTO PLAY CHORD
ONE FINGER
FINGERED
MEMORY
RHYTHM SELECT
MUSICAL DIRECTOR
CONTRAST
TRANSPOSE
TEMPO/PROGRAM
BGS(CONTROL)
DRUMS
ACCOMP 3
ACCOMP 2
ACCOMP 1
BASS
POLY 2
POLY 1
FADE OUT
KEYBOARD PERCUSSION
SPLIT POINT
CONDUCTOR
PAGE
MENU
SEQUENCER
COMPOSER
MEMORY & CONTROL
SOUND
COMPOSER PART
DIGITAL EFFECT
SUSTAIN
DIGITAL REVERB
SOUND VARIATION
SOUND SELECT
MANUAL PERCUSSION
PAD 1
PAD 2
PAD 3
DYNAMIC ACCOMP
ONE TOUCH PLAY
MUSIC STYLE ARRANGER
FILL IN 1
FILL IN 2
SEQUENCER RESET
COUNT INTRO
INTRO & ENDING
SYNCHRO & BREAK
START/STOP
TECHNI-CHORD
PANEL MEMORY
SET
MAIN VOLUME
MIN
MAX
CHORD STEP RECORD
POWER
OFF
ON
PITCH BEND
MODULATION
UP
DOWN
MAX
MIN
PHONES
Technics
KN1000
PCM KEYBOARD

BASIC FUNCTIONS

❶ DEMO ♪
Pre-recorded performances are used to demonstrate the individual appeal of the rhythms, sounds and other features.

❷ MUSICAL DIRECTOR
In the normal mode, the **MUSICAL DIRECTOR** indicates the selected sounds, rhythm, tempo and other information about the panel settings. The display is also used for setting the various sound and memory functions, as well as the key to programming when using the **SOUND**, **COMPOSER** and **SEQUENCER** features. In addition to the sliding **CONTRAST** control, the angle of the display is adjustable for easy readability.

❸ CONDUCTOR
These buttons allow you to assign a different sound to each part, and then assign the desired part to the entire keyboard, assign a different part to each section of the keyboard, or mix parts. When the keyboard is divided into sections, change the dividing point with the **SPLIT POINT** button.

❹ SOUND SELECT
The matrix is used to choose from 40 different sounds, with three variations available for each sound. An additional 10 memory locations are reserved for user-created sounds.

❺ Balance buttons
The eight sets of buttons directly below the display are used to adjust the volume of each part, as well as to set the various programmable functions of the Keyboard.

❻ Effects
Turn the **DIGITAL REVERB** button on to add reverberation to the sound. **DIGITAL EFFECT** gives the sound a thickness and diffusion. When **SUSTAIN** is on, the musical tones fade gradually after the keys are released.

❼ PITCH BEND
This wheel is moved up or down with your hand to create a continuous change in pitch. The wheel returns to the center position automatically when it is released.

❽ MODULATION
Add vibrato to the sound by turning the wheel upwards.

❾ TRANSPOSE
C is the standard setting, but you can raise or lower the key of the entire instrument with these two buttons. The transposed key is shown on the normal performance display. The two buttons are also used to move the cursor on the display when assigning names to user-created sounds and rhythms, when using the step-record mode of the **COMPOSER** and **SEQUENCER**, or when saving a performance to disk.

❿ BACKGROUND SOUND (BGS)
Seven unique background sounds add special life and interest to your performance. The **FADE OUT** button is pressed once for slowly diminishing background sound, twice for immediate cut-off. Turn on **VARIATION** for the alternate sound of the selected sound. The volume is adjusted with the **BGS** balance buttons below the display.

⓫ RHYTHM SELECT
Choose from 40 preset automatic rhythm patterns, each with three variations. An additional 10 memory locations are reserved for user-created rhythms. Other rhythm controls are **START/STOP, SYNCHRO & BREAK, INTRO & ENDING, COUNT INTRO** and **FILL IN 1** and **2.** The volume is adjusted with the **DRUMS** balance buttons below the display.

⓬ KEYBOARD PERCUSSION
One press of the **KEYBOARD PERCUSSION** button transforms your keyboard into a whole band of percussion instruments and special sounds. The keys are picture-coded for quick and easy selection.

⓭ MANUAL PERCUSSION
The three **PAD** buttons are used to add percussion sounds during your performance. The desired **KEYBOARD PERCUSSION** sounds are easily stored in the **PAD** buttons. The buttons can also be programmed for other functions, such as rhythm start/stop.

⓮ AUTO PLAY CHORD
This feature is activated when the **ONE FINGER** or **FINGERED** button is turned on. An automatic accompaniment appropriate for the selected rhythm is produced when you play a chord. **MEMORY** allows you to continue the accompaniment even after the chord keys are released. The volume for each part of the **AUTO PLAY CHORD** (**DRUMS, BASS, ACCOMP 1, 2, 3**) is adjusted with the respective balance buttons below the display.

⓯ TECHNI-CHORD
Chord notes played on the left section of the keyboard are added to melody notes played on the right section. Choose from four harmonic styles.

⓰ ONE TOUCH PLAY
Select a rhythm and press the **ONE TOUCH PLAY** button until the panel settings change. The sounds and effects perfect for the selected rhythm are automatically set in seconds. Or press the **ONE TOUCH PLAY** button briefly to access the MUSIC STYLE SELECT display. Choose one of the many music styles and the appropriate sounds, effects and even rhythm are set instantly.

⓱ MUSIC STYLE ARRANGER
A tap of a button during your performance changes the rhythm and sounds to a simpler or flashier arrangement to match the feeling of the music.

⓲ PANEL MEMORY
Set up the sounds and effects, and then store them in these 8 buttons for instant recall as you play. You can expand the range of storable settings to include the rhythm selection, tempo setting and more.

⓳ SOUND
This button is used for making the various sound, volume and effect settings for each part, as well as selecting the drum kit and **TECHNI-CHORD** type, by reading the display. It is also used with the sound-synthesizer feature to create up to 10 storable sounds.

⓴ MEMORY & CONTROL
The settable functions in this mode include initialization, **PANEL MEMORY** range, foot switch and **PAD** button function-assignment, **SEQUENCER** memory expand and touch sensitivity setting. The button is also used for the MIDI settings and when saving the **SEQUENCER** contents to (or loading them from) a disk.

㉑ COMPOSER
Create original rhythm patterns, either in realtime or with the step record method, or modify preset rhythms. Store up to 10 new rhythms in the reserved memory locations and recall them as you play, just like the preset rhythms.

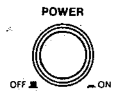
㉒ SEQUENCER
With this feature you can separately play and record the parts for an entire song. Then have the whole ensemble performance played back automatically. This is a true 8-track sequencer, with full realtime recording, step recording and editing features.

Digital Disk Recorder (optional)
This Digital Disk Recorder allows you to store up to 20 **SEQUENCER** performances on a 3.5-in. 2DD memory disk.

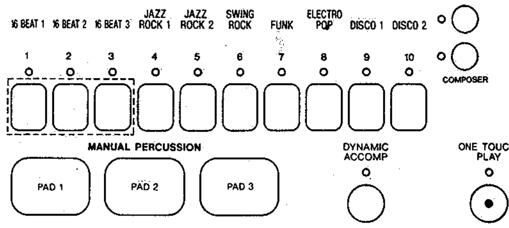
INITIAL SETTING

- The initial setting function is used to return to the original factory settings, and to reset the customer settings and misoperations.

1. Press the **POWER** button to turn off the instrument.

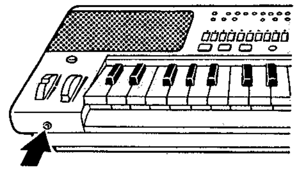


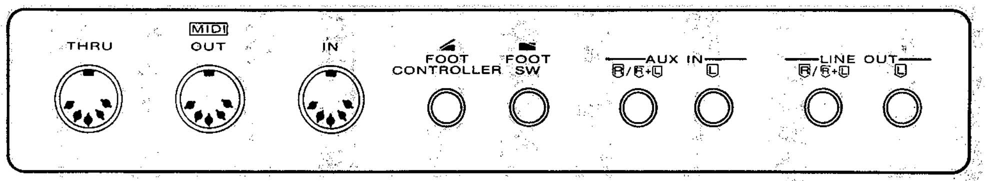
2. While pressing the three leftmost buttons in the **RHYTHM SELECT** section (**COMPOSER 1**, **2** and **3**) at the same time, turn the **POWER** button on again.



NOTE:
All stored data in the **SEQUENCER** and **COMPOSER** and other settings are initialized with this operation.

OPTIONS AND CONNECTIONS





(on the rear panel)

PHONES (🎧) (Use headphones with over 16Ω impedance.)
For silent practice headphones may be used. When plugged in, the speaker system is automatically switched off, and sound is heard only through the headphones.

MIDI (Musical Instrument Digital Interface)
MIDI is the standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics Keyboard and other instruments provided with MIDI terminals.

IN: The terminal that receives data from external equipment.
OUT: The terminal that transmits data from this instrument to external equipment.
THRU: The terminal that transfers data from the **IN** terminal directly to other equipment.

- Use a 5-pin DIN cord (less than 15m long) for these connections.

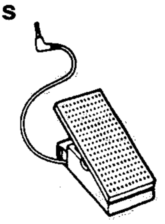
LINE OUT (output level 1 Vrms, 600 Ω)
By connecting an external high-power amplifier, the sound can be reproduced at a high volume. To output monaural sound, connect the external equipment to the **R/R+L** terminal. (Do not connect the **L** terminal.)

AUX IN (input level 0.5 Vrms, 33 kΩ)
Other instruments such as a sound generator can be connected to this terminal, and the sound will be output from the Keyboard's speakers. To receive monaural sound, connect the other instrument to the **R/R+L** terminal. (Do not connect the **L** terminal.)

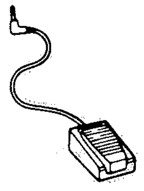
FOOT SW
The optional SZ-P1 Foot Switch can be connected to this terminal to control various functions.

FOOT CONTROLLER
The optional SZ-E2 Expression Pedal can be connected to this terminal to control the volume.

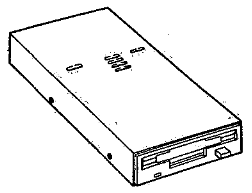
- **Options**



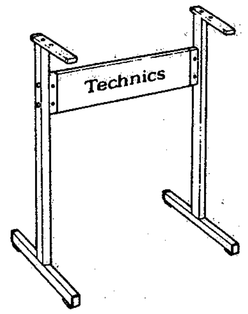
SZ-E2
Expression Pedal



SZ-P1
Foot Switch



SY-FD20
Digital Disk Recorder

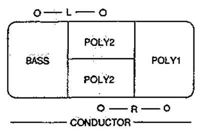
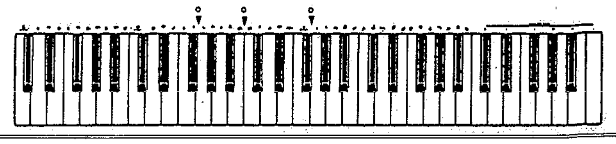
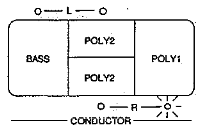
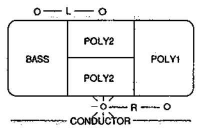
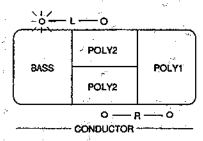
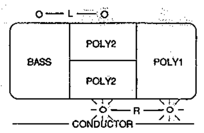


SZ-S61
Keyboard Stand

CONDUCTOR SETTINGS

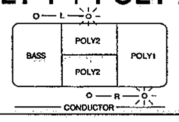
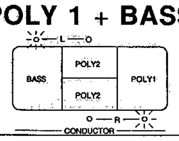
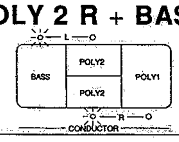
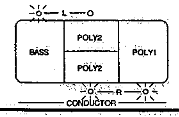
■ Assigning a part to the keyboard

There are several possible ways to assign sounds to the keyboard.

CONDUCTOR settings	How sounds are assigned to the keyboard
	
POLY 1 	**POLY 1**
POLY 2 R 	**POLY 2**
BASS 	**BASS**
POLY 1 + POLY 2 	**POLY 1 + POLY 2**

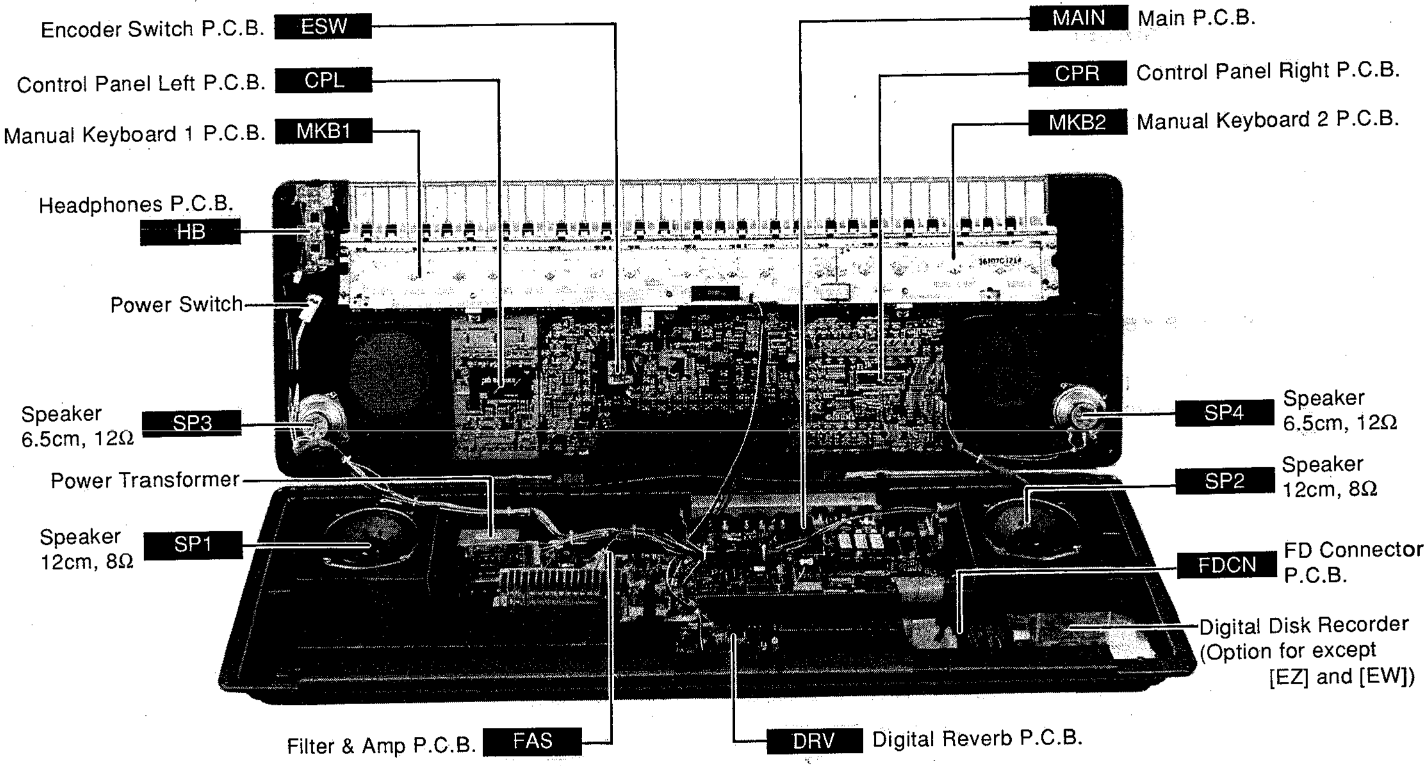
■ Assigning parts to the split keyboard

Parts can be assigned to a split keyboard in the following four ways.

CONDUCTOR settings	How sounds are assigned to the keyboard
POLY 1 + POLY 2 L 	L **POLY 2** │ R **POLY 1** Split point
POLY 1 + BASS 	L **BASS** │ R **POLY 1** Split point
POLY 2 R + BASS 	L **BASS** │ R **POLY 2** Split point
POLY 1 + POLY 2 R + BASS 	L **BASS** │ R **POLY 1 + POLY 2** Split point

- The keyboard automatically splits into left and right sections. The split point is shown by the lit indicator at G2, C3 or G3.

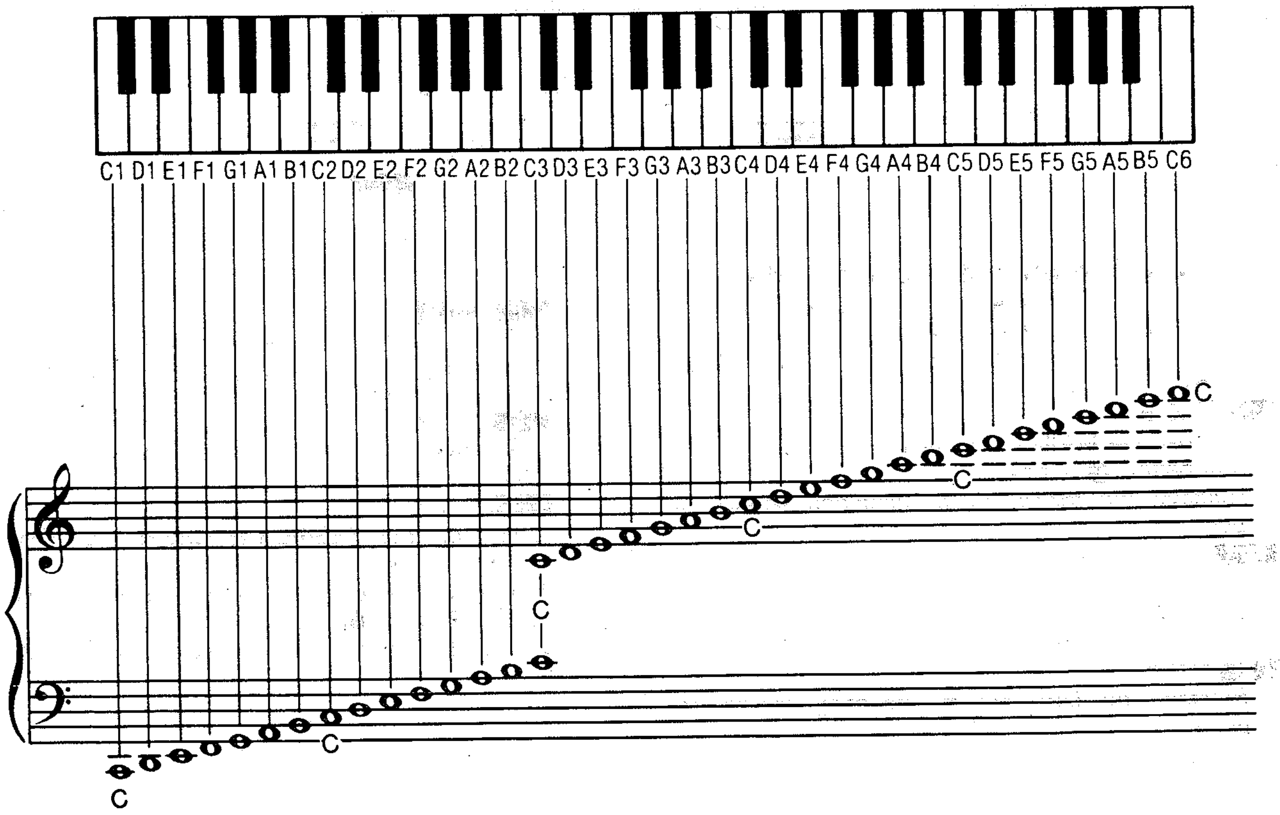
PARTS LOCATION


Encoder Switch P.C.B. ESW
Control Panel Left P.C.B. CPL
Manual Keyboard 1 P.C.B. MKB1
Headphones P.C.B. HB
Power Switch
Speaker 6.5cm, 12Ω SP3
Power Transformer
Speaker 12cm, 8Ω SP1
Filter & Amp P.C.B. FAS
MAIN Main P.C.B.
CPR Control Panel Right P.C.B.
MKB2 Manual Keyboard 2 P.C.B.
SP4 Speaker 6.5cm, 12Ω
SP2 Speaker 12cm, 8Ω
FDCN FD Connector P.C.B.
Digital Disk Recorder (Option for except [EZ] and [EW])
DRV Digital Reverb P.C.B.

[Photo-1]

KEYBOARD RANGES

- This keyboard features Touch Response, by which you control the volume by playing the keys harder or softer.


C1 D1 E1 F1 G1 A1 B1 C2 D2 E2 F2 G2 A2 B2 C3 D3 E3 F3 G3 A3 B3 C4 D4 E4 F4 G4 A4 B4 C5 D5 E5 F5 G5 A5 B5 C6
C
C
C
C
C
C

DISASSEMBLY INSTRUCTIONS

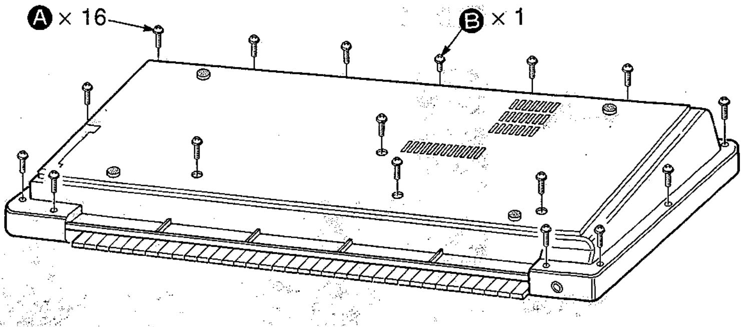
1 Opening the cabinet

1. Turn the keyboard cabinet upside down as shown in Fig. 1, and remove the bottom screws (Ⓐ 16 pcs. and brown screw Ⓑ 1 pc.).
2. Place the keyboard bottomside down, and open the top cabinet.

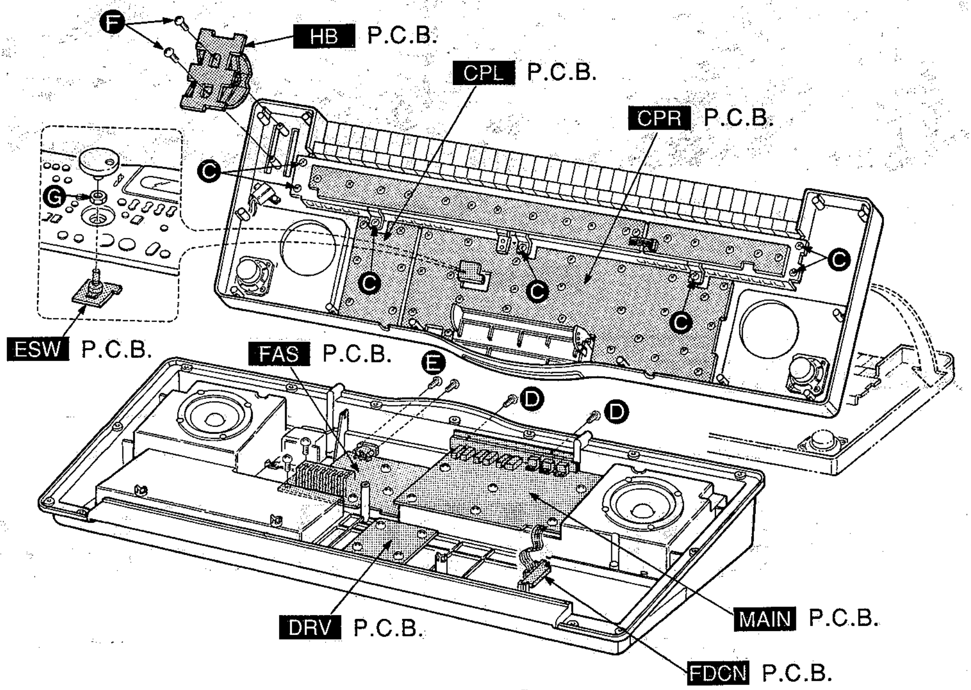
NOTE:
When closing the cabinet, be sure to use the brown screw which was removed in step 1 at position Ⓑ.

2 Removing the keyboard

1. Open the cabinet (see step 1), and turn over the control panel unit towards the rear.
2. Remove the keyboard assembly holding screws (Ⓒ 7 pcs.).



[Fig. 1]



[Fig. 2]

3 Removing the printed circuit boards

- Open the cabinet (see step 1), and turn over the control panel unit towards the rear.
- Pull out the connectors on the printed circuit boards.

MAIN P.C.B.

1. Remove the MAIN P.C.B. mounting screws on the rear panel (Ⓓ 2 pcs.).
2. Remove the MAIN P.C.B. mounting screws (6 pcs.).

FAS P.C.B.

1. Remove the AC inlet jack fixing screws on the rear panel (Ⓔ 2 pcs.).
2. Remove the FAS P.C.B. mounting screws (5 pcs.).

DRV P.C.B.

1. Remove the DRV P.C.B. mounting screws (4 pcs.).

CPL **CPR** P.C.B.

1. Remove the CPL P.C.B. mounting screws (6 pcs.) and CPR P.C.B. mounting screws (25 pcs.).
2. Remove the CPL and CPR P.C.B.s together.

HB P.C.B.

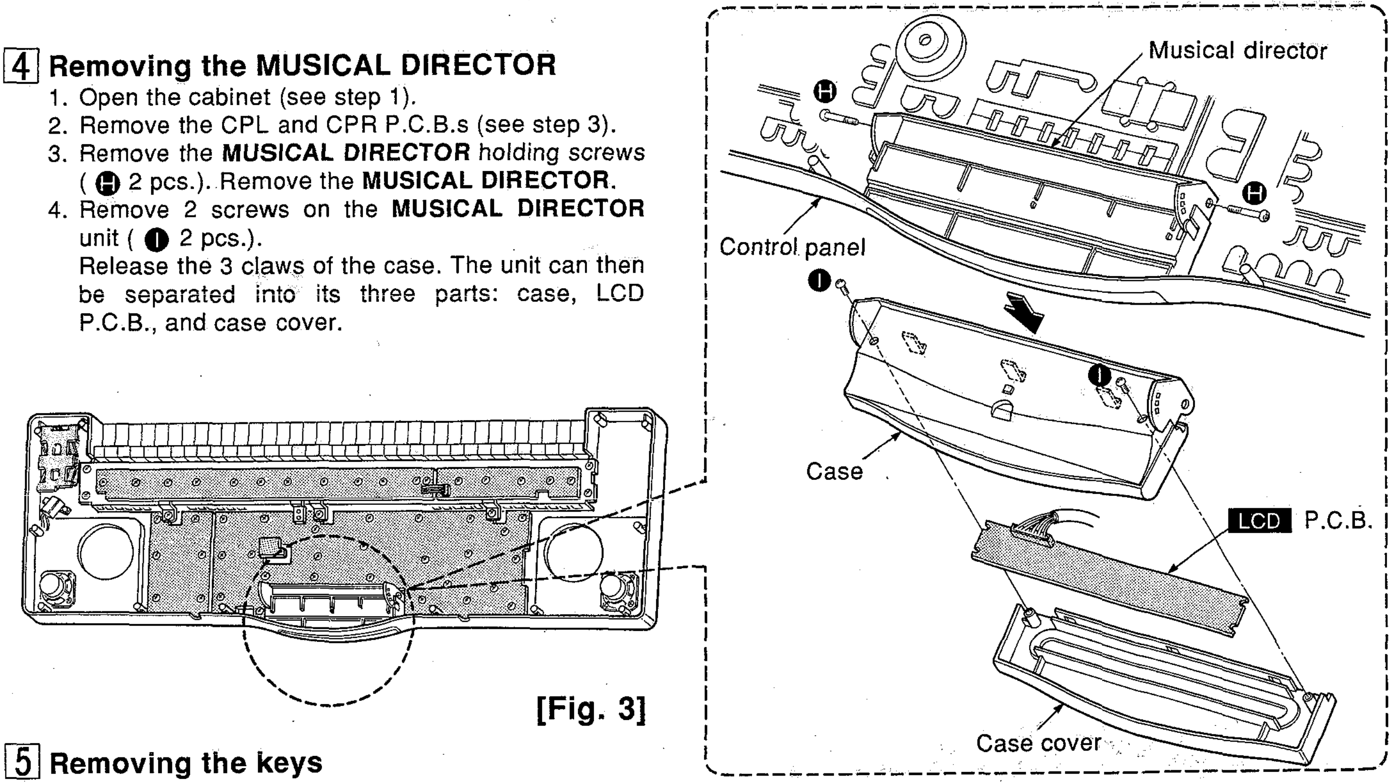
1. Remove the HB P.C.B. mounting screws (Ⓕ 2 pcs.).

ESW P.C.B.

1. Pull off the **TEMPO/PROGRAM** dial from the control panel.
2. Remove the encoder switch holding nut on the ESW P.C.B. (Ⓖ 1 pc.).
3. Open the cabinet, and remove the ESW P.C.B.

4 Removing the MUSICAL DIRECTOR

1. Open the cabinet (see step 1).
2. Remove the CPL and CPR P.C.B.s (see step 3).
3. Remove the **MUSICAL DIRECTOR** *holding* screws (Ⓗ 2 pcs.). Remove the **MUSICAL DIRECTOR**.
4. Remove 2 screws on the **MUSICAL DIRECTOR** unit (Ⓘ 2 pcs.).
   Release the 3 claws of the case. The unit can then be separated into its three parts: case, LCD P.C.B., and case cover.

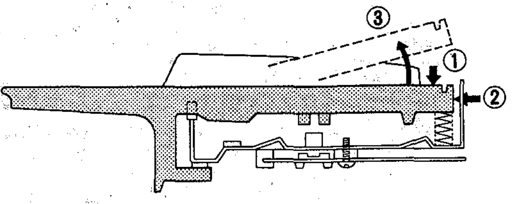


[Fig. 3]

5 Removing the keys

1. Remove the keyboard by following the procedure in step 2.
2. Press downward on the rear of the key (Fig. 4-①).
3. While pressing downward on the rear of the key, push the key forward and release it from the chassis (Fig. 4-②).
4. Lift the key and remove it from the chassis (Fig. 4-③).

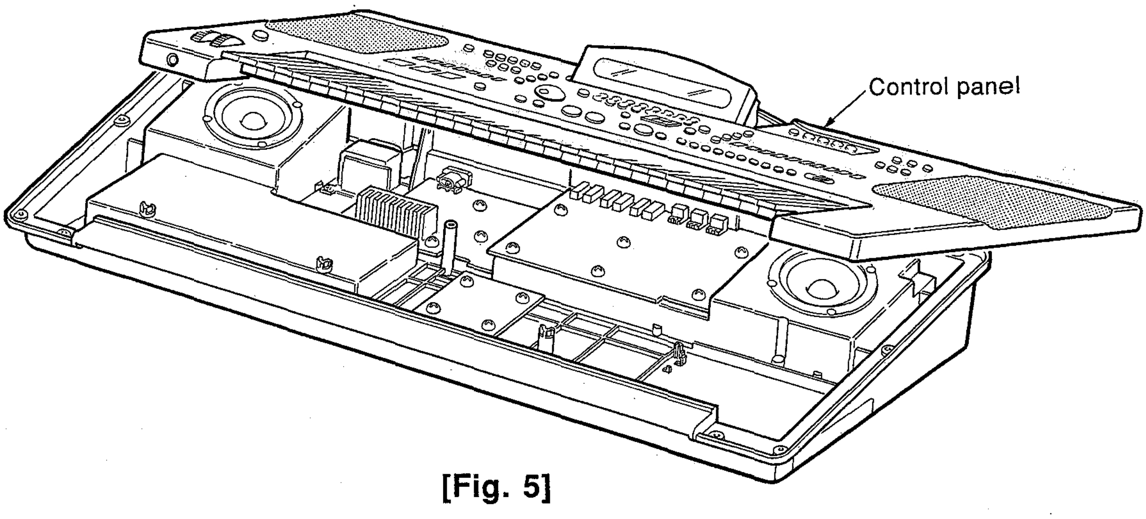
NOTE:
To remove a black key, the white key to either side of it should be removed first.



[Fig. 4]

■ INSPECTION

Inspect the printed circuit boards, etc. while operating the keyboard by first opening the cabinet and positioning the control panel unit as shown in Fig. 5.



[Fig. 5]

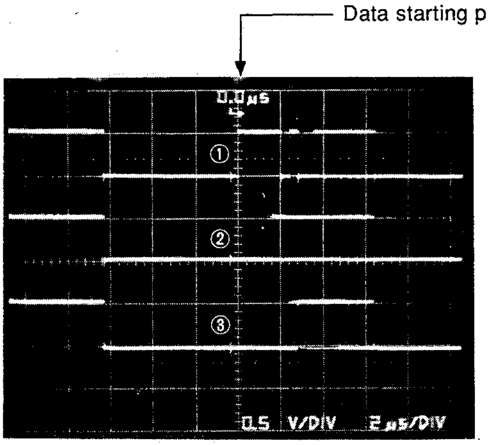
MEASUREMENTS AND ADJUSTMENTS

■ Measuring Equipment

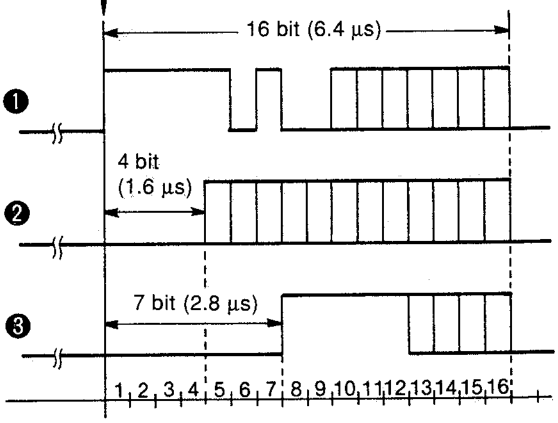
- Oscilloscope 20 MHz, 10:1 probe/1:1 probe

ADJUSTMENT	MEASURING CONDITIONS	EQUIPMENT	ADJUSTMENT P.C.B.	ADJ. POINT	CONNECT POINT(S)	READING
DRV bias	any position	Oscilloscope	DRV P.C.B.	VR1	Checkpoint ⓬ ⓭	Photo-A Fig. A

1. Connect the oscilloscope channel 1 to DRV P.C.B. checkpoint ⓬ and connect the oscilloscope external trigger to DRV P.C.B. checkpoint ⓭. (Set the oscilloscope CH1 triggering with EXT in.)
2. Turn VR1 on the DRV P.C.B. fully clockwise and set the data starting point to the oscilloscope division scale to facilitate adjustment in next procedure. (See photo A-❶.)
3. Confirm that the first 4 bits (or 5 bits) are low when VR1 is turned fully counter-clockwise. (See photo A-❷, Fig. A-❷.)
4. Gradually turn VR1 clockwise and make the first 7 bits (2.8µs) turn to low. (See photo A-❸, Fig. A-❸.)



[Photo-A]



[Fig. A]

ADJUSTMENT	MEASURING CONDITIONS	EQUIPMENT	ADJUSTMENT P.C.B.	ADJ. POINT	CONNECT POINT(S)	READING
D/A Converter offset	any position	Oscilloscope	MAIN P.C.B.	VR1	IC22- ⑦ pin	0V ±5 mV

1. Set the oscilloscope voltage division to 5 mV/cm (Use the 1:1 oscilloscope probe) and connect the oscilloscope probe to MAIN P.C.B. IC22 Pin ⑦.
2. Turn VR1 to adjust the voltage to zero.

MEMO

DIGITAL DISK RECORDER SY-FD20 (OPTION)

■ Digital Disk Recorder

One song's worth of **SEQUENCER** data can be stored in the Keyboard's internal memory. When the Digital Disk Recorder is used, the data for up to 20 **SEQUENCER** performances can be preserved on one Digital Memory Disk (3.5 inch 2DD floppy disk).

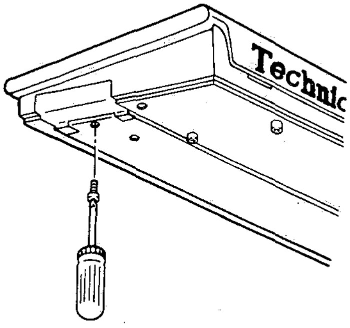
■ For Germany [EZ] and Switzerland [EW]

The SX-KN1000 sold in Germany and Switzerland has a Digital Disk Recorder already installed. This Digital Disk Recorder is a unit made especially for the SX-KN1000 and is different from the separately sold SY-FD20. Do not use it in other models.

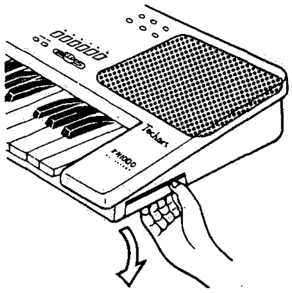
■ Installation procedures for SY-FD20 (Except for [EZ] and [EW] areas)

Make sure that the power to the Keyboard is turned off.

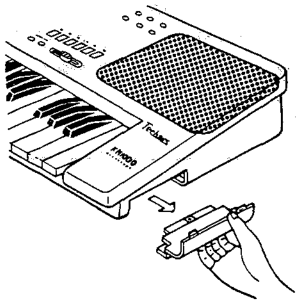
1. Remove the cover from the connector unit beneath the keyboard by first removing the screw with a cross-point screwdriver.



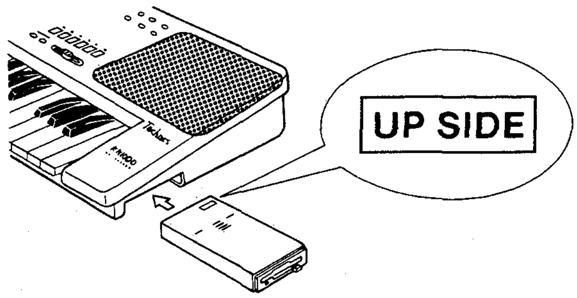
2. Use the gap at the top of the cover as a finger-hold to apply downward pressure.



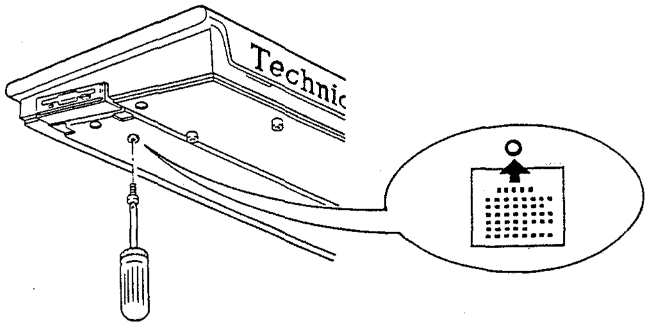
3. Pull the cover out horizontally and remove it from the Keyboard.



4. Insert the Digital Disk Recorder and push it in firmly and completely.



5. Secure the Digital Disk Recorder to the Keyboard with the screw you removed in step 1.



Note: To affix the Digital Disk Recorder, the same screw which was used to affix the cover must be used (in the place indicated by the arrow). Use of a different screw may result in malfunction of or damage to the Digital Disk Recorder.

SYMPTOMS WHICH APPEAR TO BE SIGNS OF TROUBLE

The following changes in performance may occur in the Technics Keyboard but do not indicate trouble.

Phenomenon		Remedy
Sounds and effects	The buttons, keys, etc. malfunction.	• Turn off the **POWER** button once, then turn it on again. If this procedure is not successful, turn off the **POWER** button once. Then, while pressing the three lower left buttons in the **RHYTHM SELECT** section (**1**, **2** and **3**) at the same time, turn the **POWER** button on again. (Note that, in this case, all programmable settings, functions and memories return to their factory-preset status.)
	No sound is produced when the keys are pressed.	• The **MAIN VOLUME** is at the minimum setting. Adjust the volume with the **MAIN VOLUME** control. • The **DEMO ♪** button is on. ("DEMONSTRATION SONG" is shown on the display.) Press the **DEMO ♪** button to turn it off. The display returns to the normal performance display. • The volumes for the selected parts are set to the minimum levels. Use the balance buttons to set the volumes of the relevant parts to appropriate levels. • The local control for a part performed on the keyboard is set to OFF. Set the local control to ON.
	When a chord is played, the sound of each key is different.	• The selected sound is a TRIO mode sound. TRIO mode sounds produce a different sound for each chord note.
	Only percussive instrument sounds are produced when the keyboard is played.	• The **KEYBOARD PERCUSSION** button is on. Turn it off to return the keyboard to the normal sound.
Rhythm	The rhythm does not start.	• The **DRUMS** volume is set to the minimum level. Use the balance buttons to set the **DRUMS** volume to an appropriate level. • In the **RHYTHM SELECT** section, a **COMPOSER** number button with no stored pattern was selected. Change the rhythm or store a new rhythm pattern in the **COMPOSER**. • The MIDI clock is set the external clock. Set the MIDI clock to the internal <INT> clock.
AUTO PLAY CHORD	No sound is produced for the automatic accompaniment.	• In the **RHYTHM SELECT** section, a **COMPOSER** number button with no stored pattern was selected. Change the rhythm or store a new rhythm pattern in the **COMPOSER**.
	No sound is produced for the automatic accompaniment, or only the sounds of some parts are produced.	• An **ACCOMP** part does not sound if its corresponding volume is set to the minimum level. Use the respective balance buttons to set the **ACCOMP 1**, **2** and **3** volumes to appropriate levels.

Phenomenon		Remedy
COMPOSER	Storage is not possible.	• The remaining memory capacity of the **COMPOSER** is 0. Erase a different **COMPOSER** number button in the **RHYTHM SELECT** section in which a pattern is stored. • The **SEQUENCER** memory is set to the <EXPAND> mode. Follow the procedure to set the **SEQUENCER** memory to the <NORMAL> mode.
	Setting the time signature and number of measures is not possible.	• The time signature and number of measures cannot be changed for a pattern which is currently recorded in the **COMPOSER.** If you wish to change the time signature and/or measure data, first follow the procedure to clear the memory.
	The playback timing of the rhythm pattern is different from the timing with which it was recorded.	• The quantize function was on when the pattern was recorded and the timing was automatically corrected. Set the quantize level to a smaller note unit or to OFF when recording.
SEQUENCER	Storage is not possible.	• The remaining memory capacity of the **SEQUENCER** is 0. Follow the SONG CLEAR or TRACK CLEAR procedure to erase the memory.
	Multi-track storage is not possible.	• The playback track has been selected, but the **START/STOP** button has not been pressed. A flashing track indicator shows the track which is ready for recording, and a lit track indicator shows a track which is ready for playback. To record one track while listening to another (playback) track, press the **START/STOP** button to begin playback.
	The playback measure indication is different from when the performance was recorded.	• The number of measures corresponds to the time signature of the rhythm selected at the start of recording. To change the rhythm in the middle of the song, record the rhythm change in the **RHYTHM** track.
Digital Disk Recorder (Option)	The Digital Disk Recorder produces a noise during recording or playback.	• This occurs when the Digital Disk Recorder is reading a disk. It does not indicate a problem.
	When the procedure to load from a memory disk is performed, the contents of the **SEQUENCER** memory are erased.	• When performing the load operation from a memory disk, the **SEQUENCER** memory changes to that of the data loaded from the memory disk. If you wish to preserve a song which is stored in the **SEQUENCER** memory, save it in a memory disk before performing the load procedure.

MIDI IMPLEMENTATION CHART

Keyboard [SX-KN1000] **(Transmitted)**

Function		POLY 1	POLY 2	ACCOMP 1	ACCOMP 2	ACCOMP 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	memorized
	Changed	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	—	—	
Note Number		0~127	0~127	0~127	0~127	0~127	0~127	0~127	—	Changes depending on the position of the transpose control and octave shift.
	True voice	—	—	—	—	—	—	—	—	
Velocity	Note ON	○	○	○	○	○	○	○	—	
	Note OFF	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	× (9nH:v=0)	—	
After Touch	Key's	×	×	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	×	×	
Pitch Bender		*○×	*○×	*○×	*○×	*○×	*○×	×	×	
Control Change	1	*○×	*○×	*○×	*○×	*○×	*○×	×	×	modulation
	7	*○×	*○×	*○×	*○×	*○×	*○×	*○×	*○×	volume (main volume)
	11	×	×	×	×	×	×	×	*○×	expression pedal
	64	*○×	*○×	*○×	*○×	*○×	*○×	×	×	sustain
	80	×	×	*○×	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	×	*○×	×	intro, fill in, ending
	93	*○×	*○×	*○×	*○×	*○×	*○×	×	×	chorus
	0, 32	*○×	*○×	*○×	*○×	*○×	*○×	*○×	*○×	bank select (only for Technics mode and when program change data exchange is enabled)
Prog Change		*○×	*○×	*○×	*○×	*○×	*○×	*○×	*○×	
	True #	—	—	—	—	—	—	—	—	
System exclusive		○								
System common	Song Pos	*○×								
	Song Sel	*○×								0~19
	Tune	×								
System Real Time	Clock	○								
	Commands	*○×								start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	○	○	—	
	Active Sense	○								
	Reset	×								
Notes		* ○ × ....Whether or not the data for each of these items is transmitted can be set.								

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes

Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

Keyboard [SX-KN1000] **(Recognized)**

Function		POLY 1	POLY 2	ACCOMP 1	ACCOMP 2	ACCOMP 3	BASS	DRUMS	CONTROL	Remarks
Basic Channel	Default	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	memorized
	Changed	1~16	1~16	1~16	1~16	1~16	1~16	1~16	1~16	
Mode	Default	3	3	3	3	3	3	3	3	OMNI OFF, POLY MODE
	Messages	×	×	×	×	×	×	×	×	
	Altered	—	—	—	—	—	—	—	—	
Note Number		0~127	0~127	0~127	0~127	0~127	0~127	0~127	—	Changes depending on the position of the transpose control octave shift, and sound.
	True voice	0~127	0~127	0~127	0~127	0~127	0~127	36~83	—	
Velocity	Note ON	○	○	○	○	○	○	○	—	
	Note OFF	×	×	×	×	×	×	×	—	
After Touch	Key's	×	×	×	×	×	×	×	×	
	Ch's	×	×	×	×	×	×	×	×	
Pitch Bender		*○×	*○×	*○×	*○×	*○×	*○×	×	×	
Control Change	1	*○×	*○×	*○×	*○×	*○×	*○×	×	×	modulation
	7	*○×	*○×	*○×	*○×	*○×	*○×	*○×	*○×	volume (main volume)
	11	×	×	×	×	×	×	×	*○×	expression pedal
	64	*○×	*○×	*○×	*○×	*○×	*○×	×	×	sustain
	80	×	×	*○×	×	×	×	×	×	auto play chord
	82	×	×	×	×	×	×	*○×	×	intro, fill in, ending
	93	*○×	*○×	*○×	*○×	*○×	*○×	×	×	chorus
	0, 32	*○×	*○×	*○×	*○×	*○×	*○×	*○×	*○×	bank select (only for Technics mode and when program change data exchange is enabled)
Prog Change		*○×	*○×	*○×	*○×	*○×	*○×	*○×	*○×	
	True #	0~49 0~7**	0~49	0~49	0~49	0~49	0~49	0~49	0~6	
System exclusive		○								
System common	Song Pos	*○×								0~19
	Song Sel	*○×								
	Tune	×								
System Real Time	Clock	○								
	Commands	*○×								start/stop, continue
Aux Messages	Local ON/OFF	×	×	×	×	×	×	×	—	
	All notes OFF	○	○	○	○	○	○	○	—	
	Active Sense	○								
	Reset	×								
Notes		* ○ × ....Whether or not the data for each of these items is received can be set. **Panel memory program change								

Mode 1: OMNI ON, POLY **Mode 2:** OMNI ON, MONO ○: Yes

Mode 3: OMNI OFF, POLY **Mode 4:** OMNI OFF, MONO ×: No

PRECAUTIONS BEFORE SERVICING

■ Precautions for measuring of the output waveforms.

1. The waveform was measured with a "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of the musical tone signals shown may differ somewhat due to the difference in the timing of the triggering.
2. Since the 1/10 test probe is used, the indicated voltage value on the bottom part of each waveform photo is 1/10 of the actual value (e.g. 0.2V/cm should be 2.0V/cm).
3. This PCM keyboard has a touch-sensitive type keyboard. Therefore the touch sensor level must be set to the "0" level when checking waveform measurements after activating the initial setting.
   - Initial setting method
   (1) Turn off the **POWER** button.
   (2) While pressing the three leftmost buttons in the **RHYTHM SELECT** section (**COMPOSER 1**, **2** and **3**) at the same time, turn the **POWER** button on again.
   - Touch sensitivity setting method
   (1) Select "TOUCH SENSITIVITY" in the CTRL2 section with the **MEMORY & CONTROL** button.
   (2) Adjust the touch sensitivity level to "0".
   (3) Press the **MEMORY & CONTROL** button again to set the level.

■ Important safety notice:

Components identified by a ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only the manufacturer's specified parts.

■ Symbolic marks

The symbolic marks for resistors and capacitors used in these circuits are classified following TABLE-1 and TABLE-2.

1. RESISTORS
   - Resistors without a symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
   - All resistors are 1/4 WATT, ±5% TOLERANCE unless otherwise designated in the schematic diagrams.

(TABLE-1)

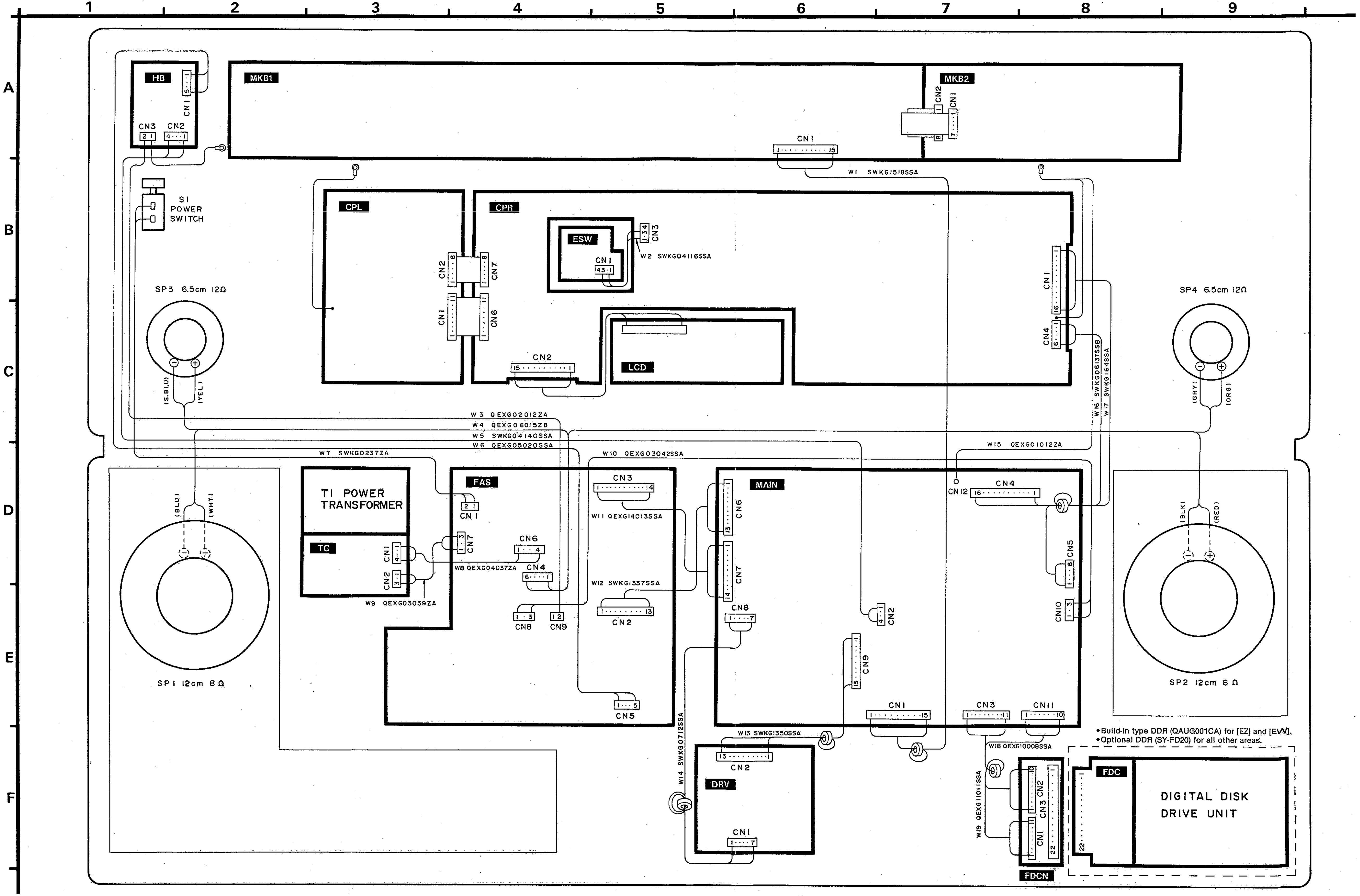
SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
Ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD_F_type)	Ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX_type)
Ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF_type)	🄵	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ_type)
Ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG_type)	🄵	Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC_type)
Ⓖ	Fixed Metal Film Resistors (Precision and High Stability) (ERO_type)		

2. CAPACITORS
   - Capacitors without a symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type, ±10% Tolerance)
   - Polarized capacitors without a symbolic mark are Aluminum Electrolytic Capacitors. (ECEA-type,±20% Tolerance)

(TABLE-2)

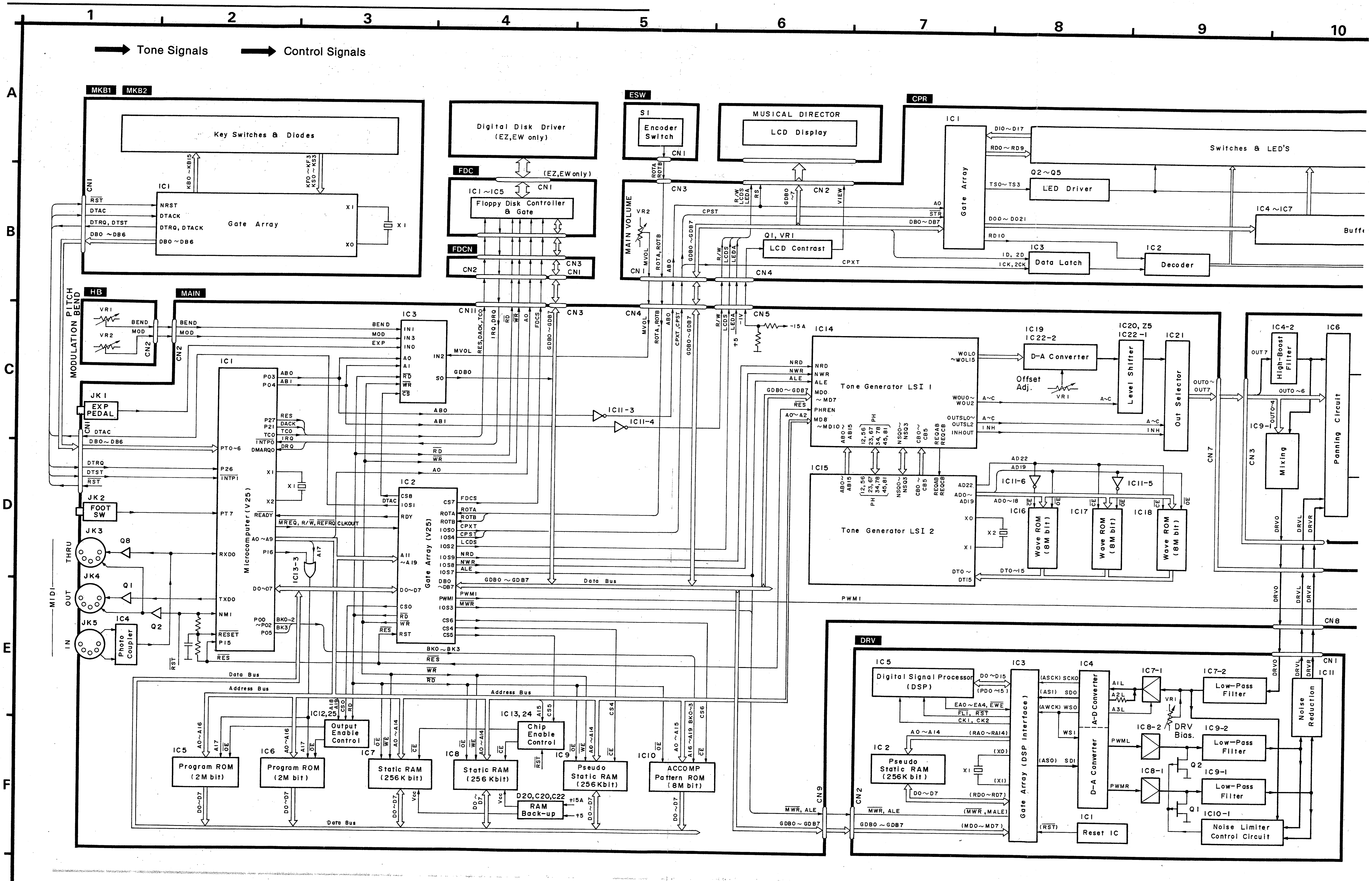
SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarized Electrolytic Capacitors	ECEA_KN_type
Ⓨ	Non-Polarized Electrolytic (for Network System)	ECEA_Y_type
(MS)	Aluminum Electrolytic Capacitors (Low leakage current type)	ECEA_M_type
Ⓩ	Aluminum Electrolytic Capacitors (Low impedance type)	ECEA_Z_type
Ⓣ	Tantalum Solid Electrolytic Capacitors	ECS_type
(TF)	Metalized Plastic Film Capacitors (TF Series)	ECQV_type
	Polyester Film Capacitors	ECQB_type
○	Temperature Compensating Ceramic Capacitors	ECC_type
	High-Dielectric Constant Ceramic Capacitors	ECK_type ECR_type
	Ceramic Capacitors (Cylinder type)	ECBA_type
	Metalized Polyester Film Capacitors for Across the Line	ECQ_EW_type
	Aluminum Electrolytic Capacitors for Smoothing Circuit	ECES_type

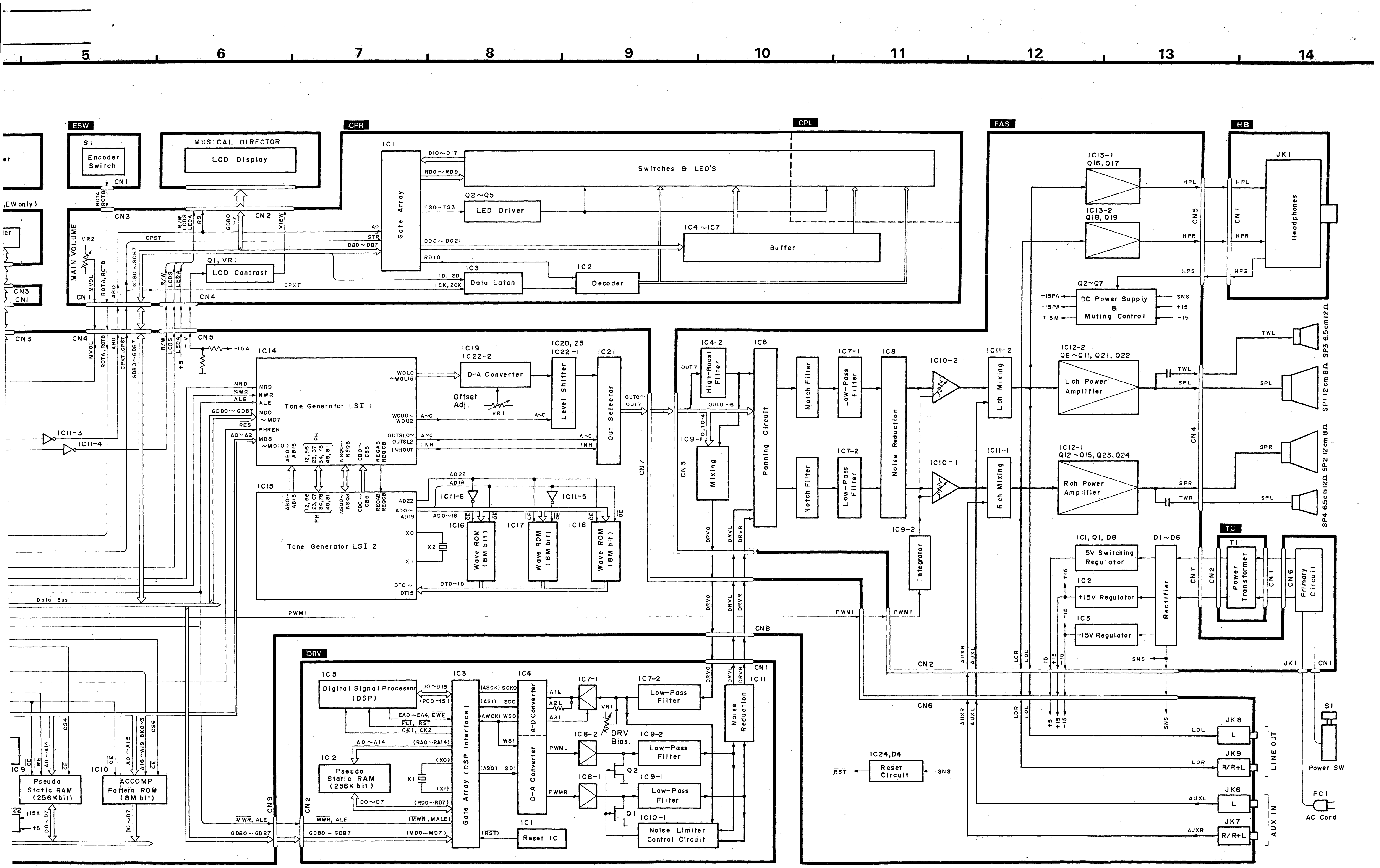
WIRING CONNECTION DIAGRAM


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
HB
CN1
5
1
CN3
CN2
2 1
4 ··· 1
MKB1
MKB2
CN2
CN1
CN1
1 ··· 15
W1 SWKG1518SSA
S1
POWER
SWITCH
CPL
CN2
CN1
CPR
CN7
CN6
ESW
CN3
1 · 34
CN1
43 · 1
W2 SWKG04116SSA
CN2
15 ··· 1
LCD
CN1
16
CN4
6 ··· 1
W16 SWKG06137SSB
W17 SWKG164SSA
SP3 6.5cm 12Ω
(S.BLU)
(YEL)
SP4 6.5cm 12Ω
(GRY)
(ORG)
W3 QEXG02012ZA
W4 QEXG06015ZB
W5 SWKG04140SSA
W6 QEXG05020SSA
W7 SWKG0237ZA
W10 QEXG03042SSA
W15 QEXG01012ZA
(BLU)
(WHT)
SP1 12cm 8Ω
T1 POWER
TRANSFORMER
TC
CN1
CN2
W9 QEXG03039ZA
FAS
CN1
2 1
CN7
1 · 3
CN6
1 ··· 4
W8 QEXG04037ZA
CN4
6 ··· 1
CN8
1 · 3
CN9
1 2
CN3
1 ··· 14
W11 QEXG14013SSA
W12 SWKG1337SSA
CN2
1 ··· 13
CN5
1 ··· 5
MAIN
CN6
CN7
CN8
1 ··· 7
CN12
CN4
16 ··· 1
CN5
CN2
CN9
CN10
CN1
1 ··· 15
CN3
1 ··· 11
CN11
1 ··· 10
(BLK)
(RED)
SP2 12cm 8Ω
W13 SWKG1350SSA
W14 SWKG07122SSA
DRV
CN2
13 ··· 1
CN1
1 ··· 7
W18 QEXG10008SSA
W19 QEXG11011SSA
CN2
CN3
CN1
FDCN
FDC
DIGITAL DISK
DRIVE UNIT

- Build-in type DDR (QAUG001CA) for [EZ] and [EW].
- Optional DDR (SY-FD20) for all other areas.

BLOCK DIAGRAM


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
Tone Signals
Control Signals
MKB1
MKB2
Key Switches & Diodes
KB0~KB15
KF0~KF3
KS0~KS3
CN1
IC1
Gate Array
RST
DTAC
DTRQ, DTST
DB0~DB6
NRST
DTACK
DTRQ, DTACK
X1
X0
Digital Disk Driver
(EZ,EW only)
FDC
(EZ,EW only)
IC1~IC5
Floppy Disk Controller & Gate
FDCN
CN2
CN3
ESW
S1
Encoder Switch
MUSICAL DIRECTOR
LCD Display
MAIN VOLUME
VR2
MVOL
ROTA, ROTB
AB0
GDB0~GDB7
Q1, VR1
LCD Contrast
CPST
CPXT
CN4
CPR
IC1
Gate Array
DI0~DI17
RD0~RD9
Switches & LED'S
Q2~Q5
LED Driver
TS0~TS3
DO0~DO21
IC4~IC7
Buff
IC3
Data Latch
IC2
Decoder
HB
VR1
VR2
BEND
MOD
PITCH BEND
MODULATION
MAIN
IC3
IN1
IN3
IN0
IN2
S0
IC1
Microcomputer (V25)
JK1
EXP PEDAL
JK2
FOOT SW
JK3
JK4
JK5
THRU
OUT
IN
MIDI
Q8
Q1
Q2
IC4
Photo Coupler
RES, DACK, TC0
IRQ, DRQ
RD
WR
A0
FDCS
CN5
-15A
+5
IC11-3
IC11-4
IC2
Gate Array (V25)
IC13-3
Data Bus
Address Bus
IC14
Tone Generator LSI 1
NRD
NWR
ALE
MD0~MD7
PHREN
MD8~MD10
WOL0~WOL15
WOU0~WOU2
OUTSL0~OUTSL2
INHOUT
IC15
Tone Generator LSI 2
IC11-6
IC11-5
IC16
IC17
IC18
Wave ROM (8M bit)
X2
PWM1
IC19
IC22-2
D-A Converter
Offset Adj.
IC20, Z5
IC22-1
Level Shifter
IC21
Out Selector
CN7
IC4-2
High-Boost Filter
IC6
Panning Circuit
IC9-1
Mixing
CN3
DRV0
DRVL
DRVR
CN8
IC5
Program ROM (2M bit)
IC6
Program ROM (2M bit)
IC12, 25
Output Enable Control
IC7
Static RAM (256K bit)
IC8
Static RAM (256 Kbit)
IC13, 24
Chip Enable Control
IC9
Pseudo Static RAM (256Kbit)
IC10
ACCOMP Pattern ROM (8M bit)
D20, C20, C22
RAM Back-up
CN9
DRV
CN2
IC5
Digital Signal Processor (DSP)
IC2
Pseudo Static RAM (256K bit)
IC3
Gate Array (DSP Interface)
IC4
A-D Converter
D-A Converter
IC1
Reset IC
IC7-1
IC7-2
Low-Pass Filter
VR1
DRV Bias.
IC8-2
IC9-2
IC8-1
IC9-1
Q1
Q2
IC10-1
Noise Limiter Control Circuit
IC11
Noise Reduction
CN1


5
6
7
8
9
10
11
12
13
14
ESW
S1
Encoder Switch
CN1
MUSICAL DIRECTOR
LCD Display
CPR
IC1
Gate Array
DI0~DI7
RD0~RD9
TS0~TS3
DO0~DO21
RDIO
Switches & LED'S
CPL
Q2~Q5
LED Driver
IC4~IC7
Buffer
IC3
Data Latch
IC2
Decoder
ID, 2D
ICK, 2CK
A0
STR
DB0~DB7
CPST
CPXT
Q1, VR1
LCD Contrast
CN2
CN3
CN4
CN1
MAIN VOLUME
VR2
MVOL
ROTA, ROTB
AB0
GDB0~GDB7
R/W
LCDS
LEDA
RS
GDB0~7
VIEW
EW only)
CN3
CN1
CN3
CN4
CN5
-15A
+5
-1V
IC14
Tone Generator LSI 1
NRD
NWR
ALE
GDB0~GDB7
RES
A0~A2
MD0~MD7
PHREN
MD8~MD10
WOL0~WOL15
WOU0~WOU2
OUTSL0~OUTSL2
INHOUT
A~C
INH
AB0~AB15
12,56 23,67 34,78 45,81
PH
NSQ0~NSQ3
CB0~CB5
REQAB
REQCB
IC11-3
IC11-4
IC15
Tone Generator LSI 2
AD22
AD19
AD0~AD19
AD0~18
X0
X2
X1
DT0~DT15
DT0~15
IC19
IC22-2
D-A Converter
Offset Adj.
VR1
IC20, Z5
IC22-1
Level Shifter
IC21
Out Selector
OUT0~OUT7
IC11-6
IC11-5
CE
OE
IC16
IC17
IC18
Wave ROM (8M bit)
Data Bus
PWM1
CN7
CN3
IC4-2
High-Boost Filter
OUT7
OUT0~6
OUT0~4
IC9-1
Mixing
IC6
Panning Circuit
Notch Filter
IC7-1
Low-Pass Filter
IC7-2
IC8
Noise Reduction
IC10-2
IC10-1
IC11-2
L ch Mixing
IC11-1
R ch Mixing
IC9-2
Integrator
DRVO
DRVL
DRVR
FAS
IC13-1
Q16, Q17
IC13-2
Q18, Q19
HPL
HPR
HPS
Q2~Q7
DC Power Supply & Muting Control
+15PA
-15PA
+15M
SNS
+15
-15
IC12-2
Q8~Q11, Q21, Q22
L ch Power Amplifier
IC12-1
Q12~Q15, Q23, Q24
R ch Power Amplifier
TWL
SPL
SPR
TWR
CN5
CN4
HB
JK1
Headphones
SP3 6.5cm 12Ω
SP1 12cm 8Ω
SP2 12cm 8Ω
SP4 6.5cm 12Ω
IC1, Q1, D8
5V Switching Regulator
IC2
+15V Regulator
IC3
-15V Regulator
D1~D6
Rectifier
CN7
CN2
TC
T1
Power Transformer
CN1
CN6
Primary Circuit
CN8
CN2
CN6
AUXR
AUXL
LOR
LOL
+5
+15
-15
SNS
JK1
CN1
JK8
L
JK9
R/R+L
LINE OUT
JK6
JK7
AUX IN
S1
Power SW
PC1
AC Cord
IC24, D4
Reset Circuit
RST
DRV
IC5
Digital Signal Processor (DSP)
D0~D15
(PD0~15)
EA0~EA4, EWE
FL1, RST
CK1, CK2
IC3
Gate Array (DSP Interface)
IC4
A-D Converter
D-A Converter
(ASCK) SCKO
(ASI) SDO
(AWCK) WSO
WSI
(ASO) SDI
AIL
A2L
A3L
PWML
PWMR
IC7-1
IC7-2
Low-Pass Filter
VR1
IC8-2
DRV Bias.
IC9-2
Q2
IC8-1
IC9-1
Q1
IC10-1
Noise Limiter Control Circuit
IC11
Noise Reduction
IC2
Pseudo Static RAM (256K bit)
A0~A14
(RA0~RA14)
(X0)
X1
(X1)
D0~D7
(RD0~RD7)
MWR, ALE
(MWR, MALE)
GDB0~GDB7
(MD0~MD7)
(RST)
IC1
Reset IC
CN9
CN2
IC9
Pseudo Static RAM (256Kbit)
IC10
ACCOMP Pattern ROM (8M bit)
OE
WE
A0~A14
CE
CS4
A0~A15
A16~A19 BK0~3
CS6
D0~D7
+15A
+5

MAIN

MAIN AND FD CONNECTOR CIRCUIT DIAGRAM

NOTES: MAIN

- IC'S

IC1:	SVIGD70320GJ	IC12, 13:	M74HC32FP
IC2:	SVIGMB621407	IC14:	MN73012PGC
IC3:	SVIGMSM6253	IC15:	MN73013PGD
IC4:	SVIGTLP513	IC16:	QSIGH3C08D48
IC5:	QSIGBKN10BX0	IC17:	QSIGU3C08066
IC6:	QSIGBKN10AX0	IC18:	QSIGU3C08065
IC7, 8:	SVIGD43256AL	IC19:	SVIGPCM54
IC9:	SVIGHM65256	IC20, 21:	T74H4051AF
IC10:	QSIGH3C08C11	IC22:	M5238FP
IC11:	M74HC04FP	IC24, 25:	M74HC00FP

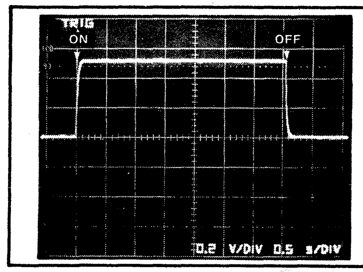
- TRANSISTORS

Q1, 2, 8:	2SA1015-GR

- DIODES

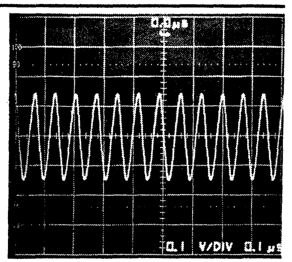
D1～15, 19:	MA165TA5
D17, 18:	MA4051MTA
D20:	MA4056H

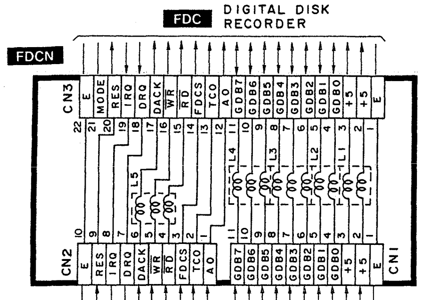
❶ $\overline{\text{RESET}}$

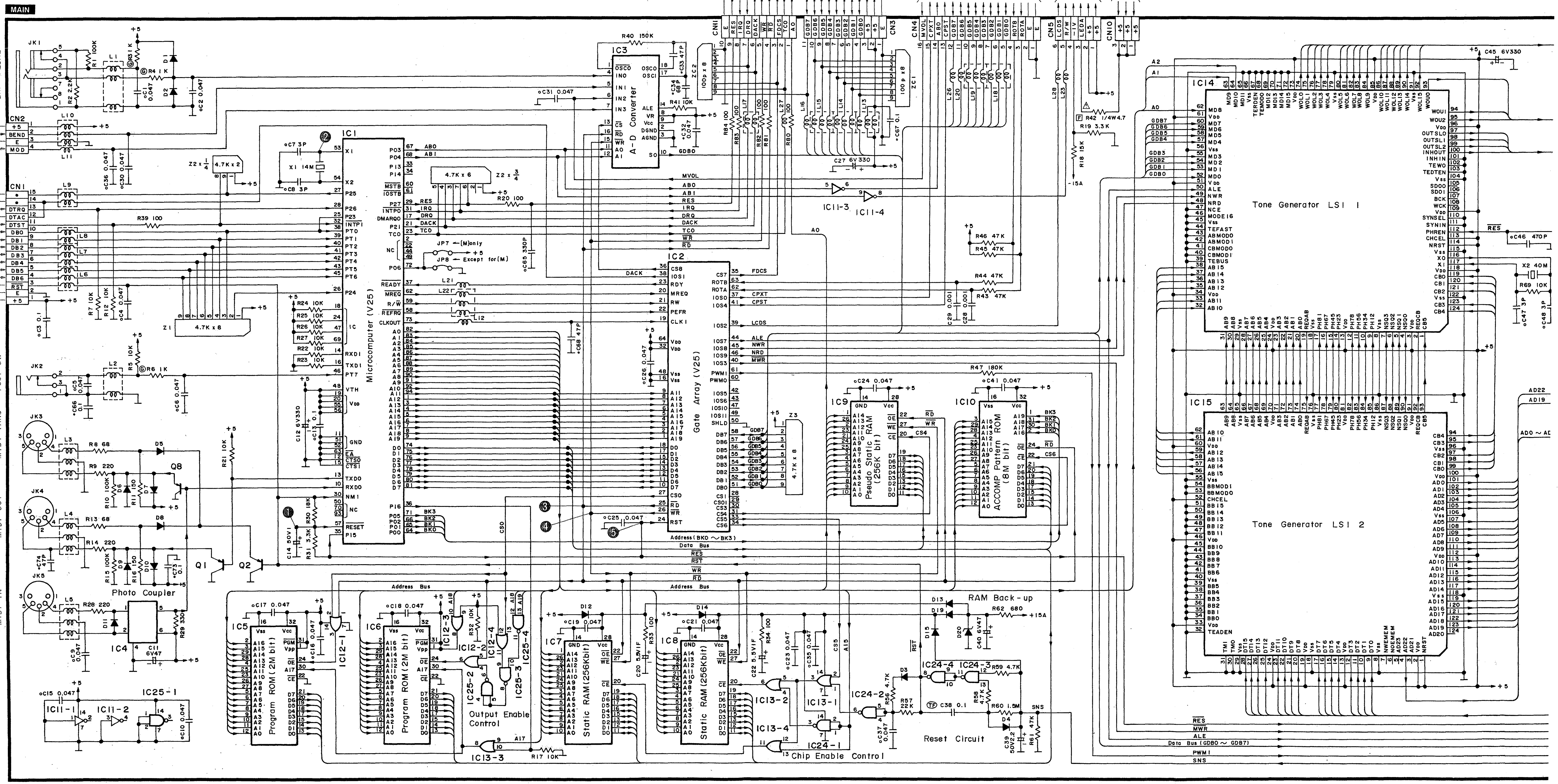


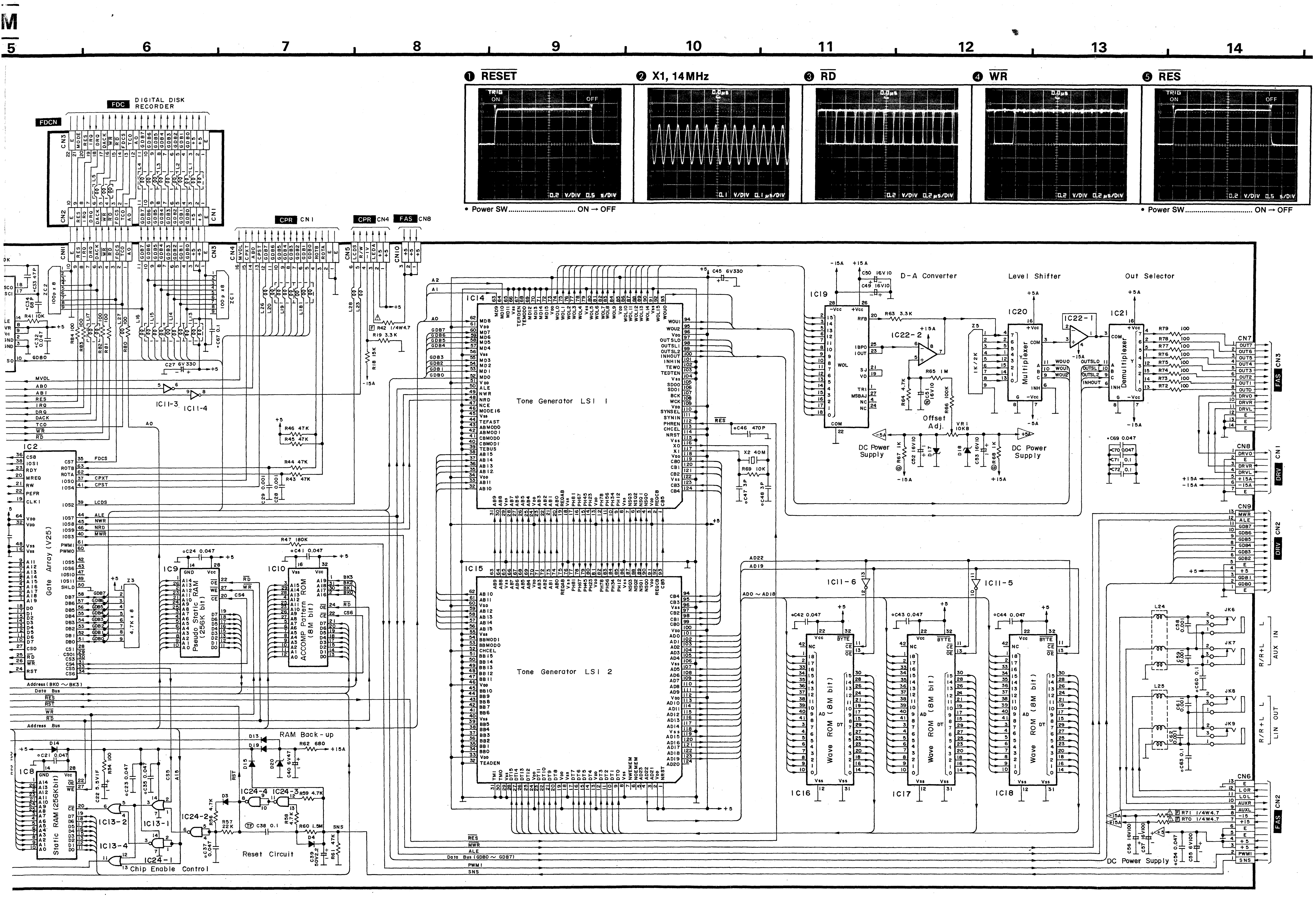
- Power SW................................ ON → OFF

❷ X1, 14MHz




FDC DIGITAL DISK RECORDER
FDCN
CN3
CN2
CN1
E
RES
IRQ
DRQ
DACK
WR
RD
FDCS
TCO
A0
GDB7
GDB6
GDB5
GDB4
GDB3
GDB2
GDB1
GDB0
+5


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
MAIN
CPR CN1
CPR CN4
FAS CN8
CN11
CN3
CN4
CN5
CN10
JK1
EXP PEDAL
HB CN2
MKB1 CN1
JK2
FOOT SW
JK3
MIDI THRU
JK4
MIDI OUT
JK5
MIDI IN
Photo Coupler
IC4
IC1
Microcomputer (V25)
X1 14M
IC2
Gate Array (V25)
IC3
A-D Converter
IC5
Program ROM (2M bit)
IC6
Program ROM (2M bit)
Output Enable Control
IC7
Static RAM (256Kbit)
IC8
Static RAM (256Kbit)
IC9
Pseudo Static RAM (256K bit)
IC10
ACCOMP Pattern ROM (8M bit)
IC11-1
IC11-2
IC11-3
IC11-4
IC12-1
IC12-2
IC12-3
IC12-4
IC13-1
IC13-2
IC13-3
IC13-4
IC24-1
IC24-2
IC24-3
IC24-4
IC25-1
IC25-2
IC25-3
IC25-4
Chip Enable Control
RAM Back-up
Reset Circuit
IC14
Tone Generator LSI 1
IC15
Tone Generator LSI 2
Q1
Q2
Q8
Address Bus
Data Bus
Address (BK0 ~ BK3)
Data Bus (GDB0 ~ GDB7)
JP7 (M) only
JP8 Except for (M)
X2 40M
MVOL
FDCS
CPXT
CPST
LCDS
RES
MWR
ALE
PWM1
SNS
AD0 ~ AD
+5
+15A
-15A
❶
❷
❸
❹
❺


M
5
6
7
8
9
10
11
12
13
14
❶ RESET
TRIG ON
OFF
0.2 V/DIV 0.5 s/DIV
❷ X1, 14MHz
0.1 V/DIV 0.1 μs/DIV
❸ RD
0.2 V/DIV 0.2 μs/DIV
❹ WR
0.2 V/DIV 0.2 μs/DIV
❺ RES
TRIG ON
OFF
0.2 V/DIV 0.5 s/DIV
FDC DIGITAL DISK RECORDER
FDCN
CN3
CN2
CN1
CPR CN1
CPR CN4
FAS CN8
CN11
CN4
CN5
CN10
ZC1 100p x 8
ZC2 100p x 8
IC2
Gate Array (V25)
IC11-3
IC11-4
IC9
Pseudo Static RAM (256K bit)
IC10
ACCOMP Pattern ROM (8M bit)
Z3 4.7K x 8
IC14
Tone Generator LSI 1
IC15
Tone Generator LSI 2
X2 40M
IC19
D-A Converter
IC22-2
IC22-1
IC20
Level Shifter
Multiplexer
IC21
Out Selector
Demultiplexer
Offset Adj.
VR1 10KB
DC Power Supply
DC Power Supply
CN7
FAS CN3
CN8
DRV CN1
CN9
DRV CN2
IC11-6
IC11-5
IC16
IC17
IC18
Wave ROM (8M bit)
Wave ROM (8M bit)
Wave ROM (8M bit)
JK6
JK7
AUX IN
R/R+L
L
JK8
JK9
LIN OUT
R/R+L
L
L24
L25
CN6
FAS CN2
DC Power Supply
IC8
Static RAM (256Kbit)
IC13-2
IC13-1
IC13-4
IC24-1
Chip Enable Control
IC24-2
IC24-4
IC24-3
RAM Back-up
Reset Circuit
Address (BK0 ~ BK3)
Data Bus
Address Bus
Data Bus (GDB0 ~ GDB7)
RES
MWR
ALE
PWM1
SNS

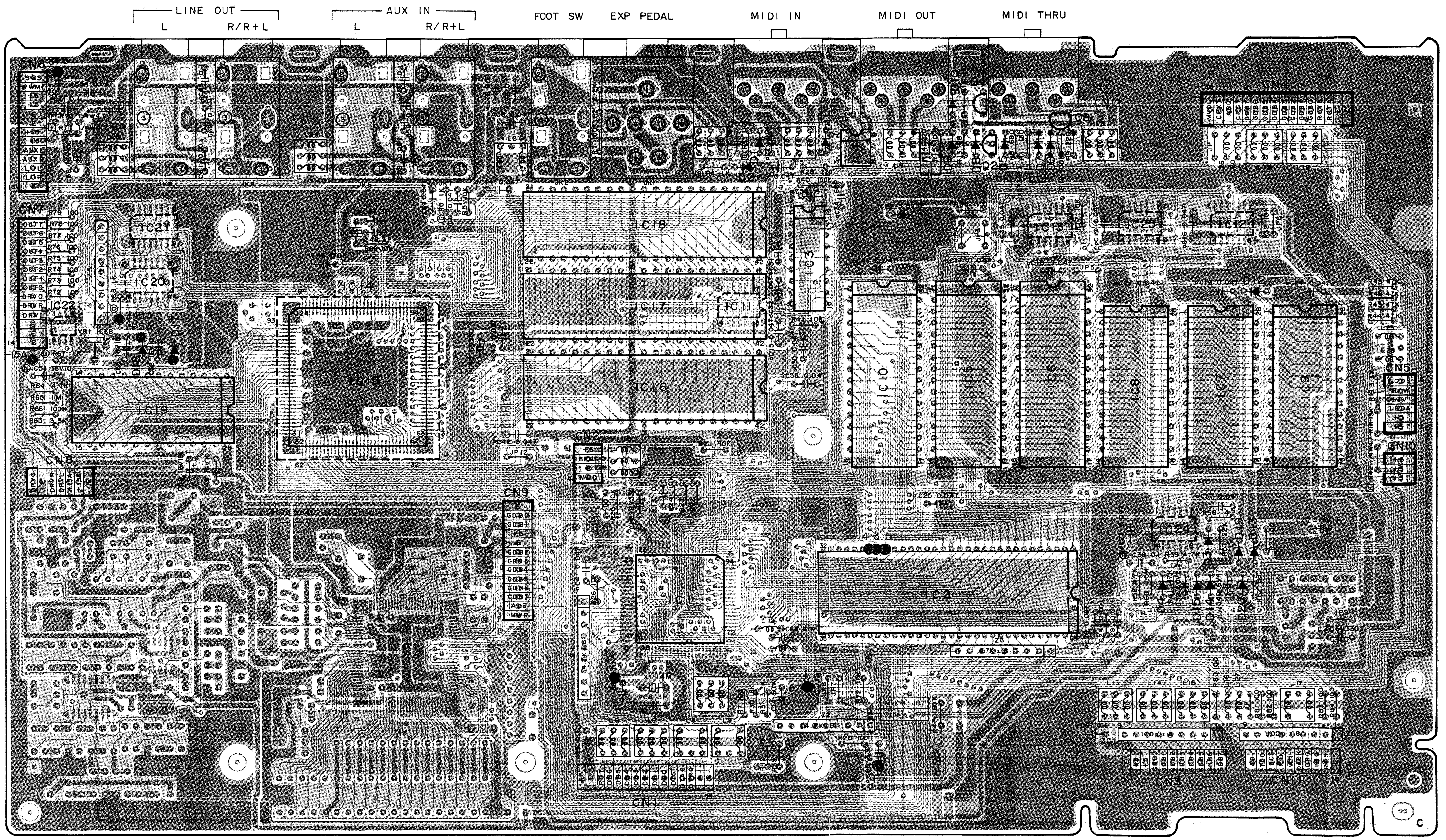
• Power SW.............................. ON → OFF

• Power SW.............................. ON → OFF

MAIN | MAIN AND FD CONNECTOR CIRCUIT BOARD

- [M] [XM] areas..... **SXPG206421**
- Other areas......... **SXPG206411**

MAIN Circuit view on top of P.C.B.



LINE OUT
L
R/R+L
AUX IN
L
R/R+L
FOOT SW
EXP PEDAL
MIDI IN
MIDI OUT
MIDI THRU
CN6
CN7
CN8
CN9
CN2
CN1
CN3
CN11
CN4
CN5
CN10
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC14
IC15
IC16
IC17
IC18
IC19
IC20
IC21
IC22
IC24
IC25
Q8
D2
D12

MAIN

NOTES:

- IC'S

IC1:	SVIGD70320GJ
IC2:	SVIGMB621407
IC3:	SVIGMSM6253
IC4:	SVIGTLP513
IC5:	QSIGBKN10BX0
IC6:	QSIGBKN10AX0
IC7, 8:	SVIGD43256AL
IC9:	SVIGHM65256
IC10:	QSIGH3C08C11
IC11:	M74HC04FP
IC12, 13:	M74HC32FP
IC14:	MN73012PGC
IC15:	MN73013PGD
IC16:	QSIGH3C08D48
IC17:	QSIGU3C08066
IC18:	QSIGU3C08065
IC19:	SVIGPCM54
IC20, 21:	T74H4051AF
IC22:	M5238FP
IC24, 25:	M74HC00FP

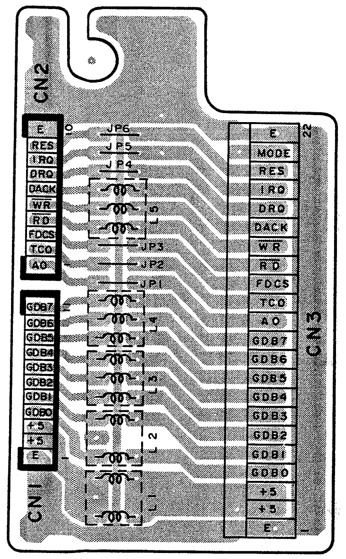
- TRANSISTORS

Q1, 2, 8:	2SA1015-GR

- DIODES

D1～15, 19:	MA165TA5
D17, 18:	MA4051MTA
D20:	MA4056H

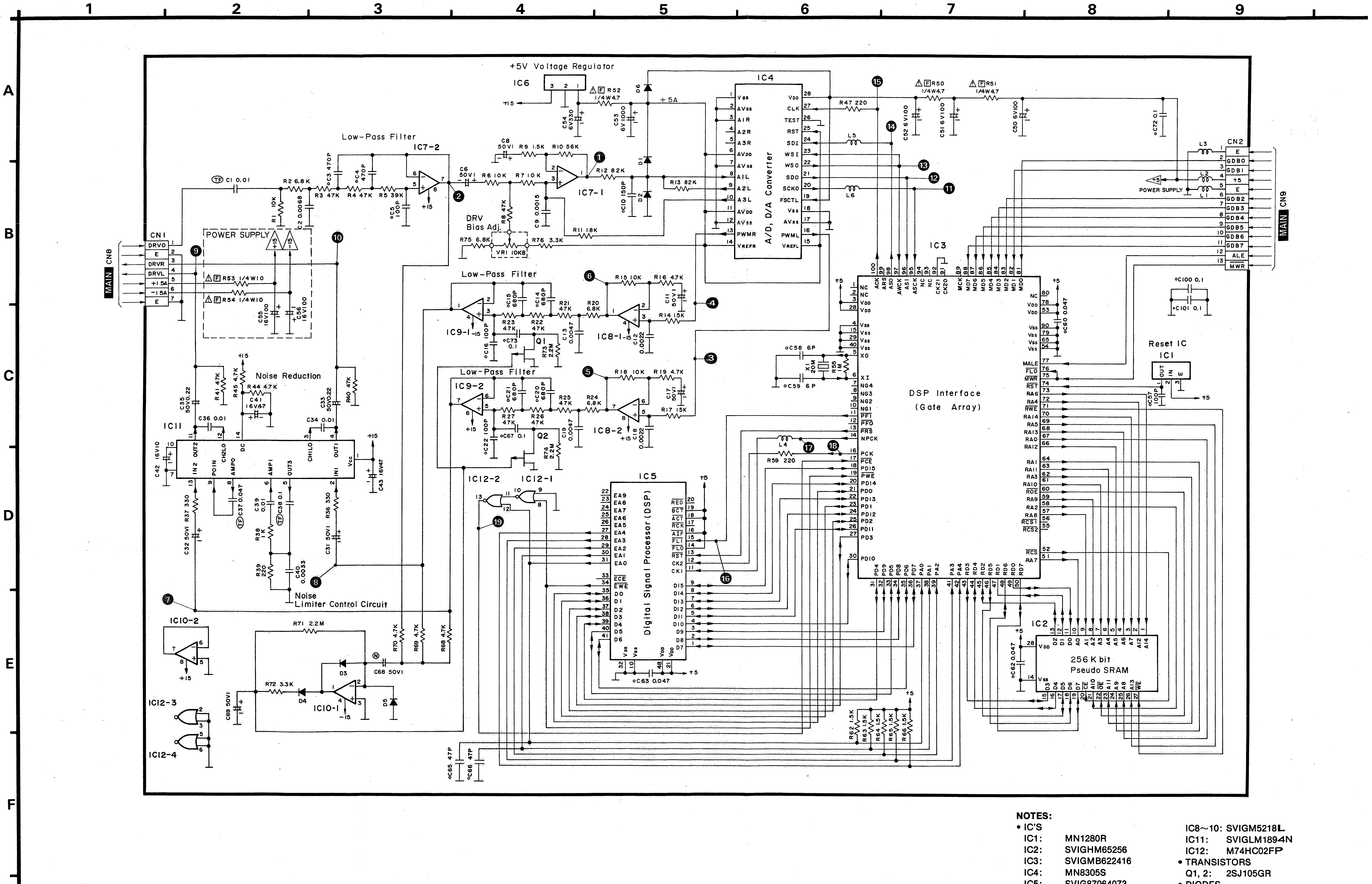
FDCN **SXPG208721**



CN2
CN1
CN3
JP1
JP2
JP3
JP4
JP5
JP6
E
RES
IRQ
DRQ
DACK
WR
RD
FDCS
TCO
A0
GDB7
GDB6
GDB5
GDB4
GDB3
GDB2
GDB1
GDB0
+5
MODE

DRV

DIGITAL REVERB CIRCUIT DIAGRAM


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
+5V Voltage Regulator
IC6
IC4
A/D, D/A Converter
Low-Pass Filter
IC7-2
IC7-1
DRV Bias Adj.
VR1 10KB
POWER SUPPLY
MAIN CN8
CN1
DRVO
DRVR
DRVL
+15A
-15A
Low-Pass Filter
IC9-1
IC8-1
IC9-2
IC8-2
Q1
Q2
Noise Reduction
IC11
Noise Limiter Control Circuit
IC10-2
IC10-1
IC12-3
IC12-4
IC12-2
IC12-1
IC5
Digital Signal Processor (DSP)
IC3
DSP Interface (Gate Array)
IC2
256 K bit Pseudo SRAM
Reset IC
IC1
CN2
MAIN CN9
POWER SUPPLY
GDB0
GDB1
GDB2
GDB3
GDB4
GDB5
GDB6
GDB7
ALE
MWR

NOTES:

- IC'S

IC1:	MN1280R
IC2:	SVIGHM65256
IC3:	SVIGMB622416
IC4:	MN8305S
IC5:	SVIG87064073
IC6:	SVIGM5278L05
IC7:	SVIGM5220L
IC8~10:	SVIGM5218L
IC11:	SVIGLM1894N
IC12:	M74HC02FP

- TRANSISTORS

Q1, 2:	2SJ105GR

- DIODES

D1~5:	MA165TA5
D6:	EK04

DRV DIGITAL REVERB CIRCUIT BOARD

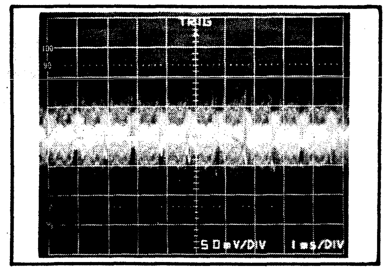
1 2 3 4 5 6 7 8 9

A B C D E F

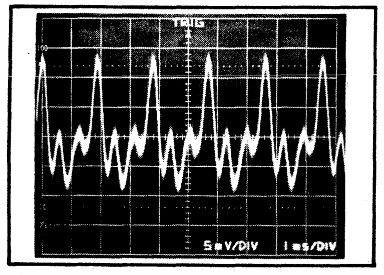
Waveform measurement

1. Activate the initial setting method. (Refer to page I-15)
2. Set the touch sensitivity level to the "0". (Refer to page I-15)
3. Set the keyboard to required mode followings.
   - SOUND SELECT .... FLUTE
   - SOUND VARIATION 1
   - DIGITAL REVERB .... ON
   - Key .... C4 key

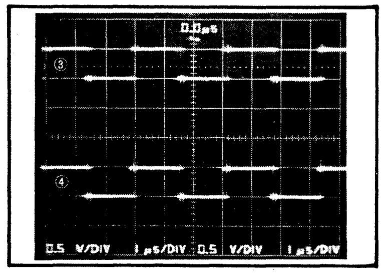
❶



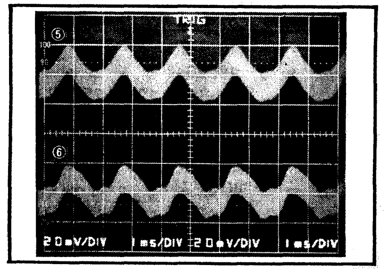
❷



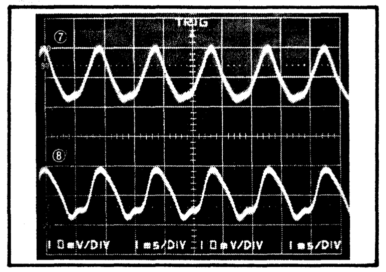
❸, ❹



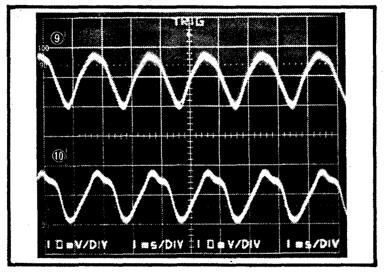
❺, ❻



❼, ❽

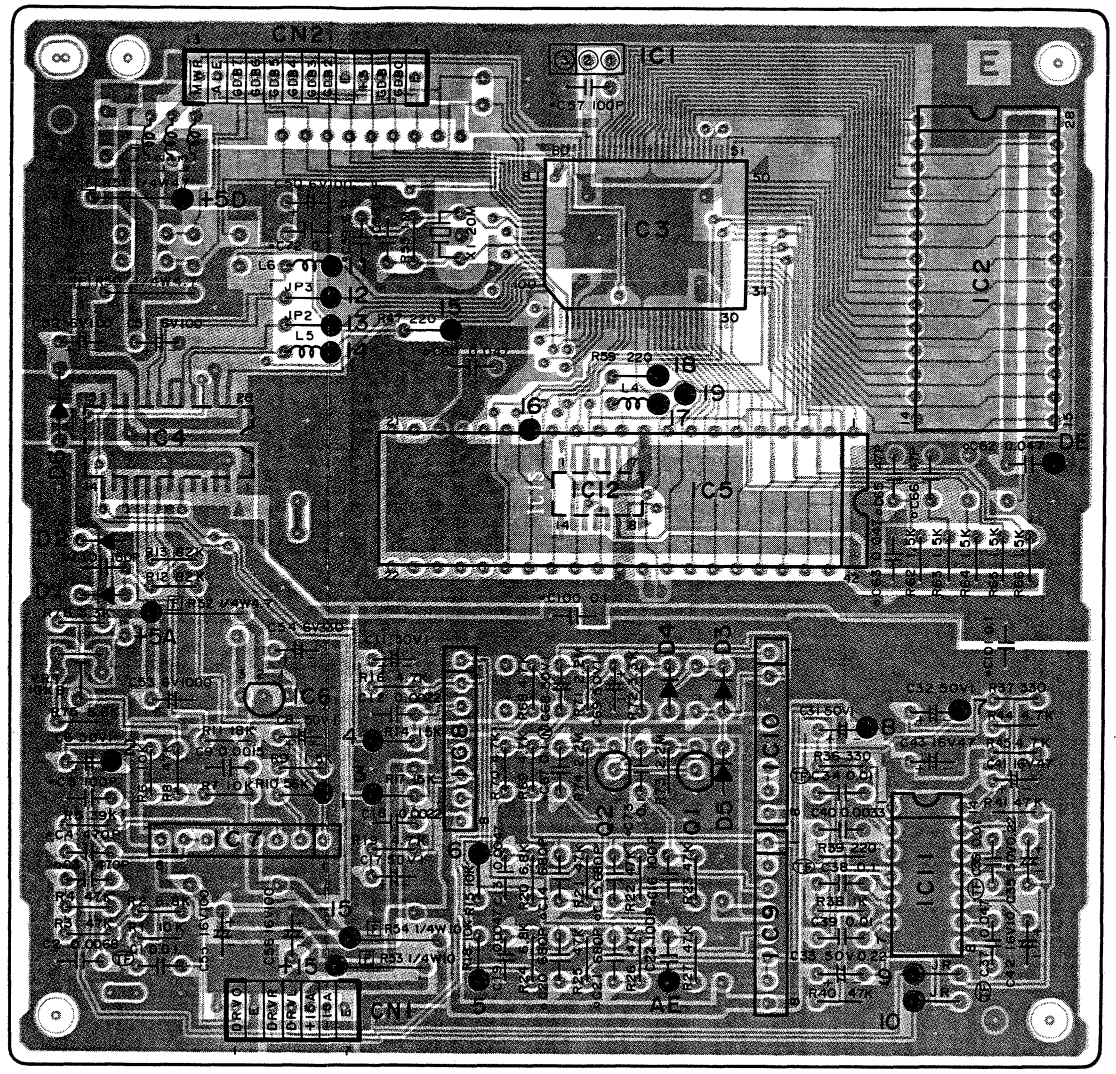


❾, ❿



Circuit view on top of P.C.B.

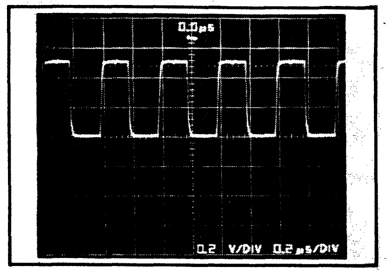
SXPG146071


CN2
IC1
E
IC3
IC2
IC4
IC5
IC12
IC6
IC10
IC7
IC9
IC11
D1
D2
D3
D4
D5
D6
Q1
Q2
CN1
AE
DE
5D
5A
10

NOTES:

- IC'S
  - IC1: MN1280R
  - IC2: SVIGHM65256
  - IC3: SVIGMB622416
  - IC4: MN8305S
  - IC5: SVIG87064073
  - IC6: SVIGM5278L05
  - IC7: SVIGM5220L
  - IC8～10: SVIGM5218L
  - IC11: SVIGLM1894N
  - IC12: M74HC02FP
- TRANSISTORS
  - Q1, 2: 2SJ105GR
- DIODES
  - D1～5: MA165TA5
  - D6: EK04

⓫



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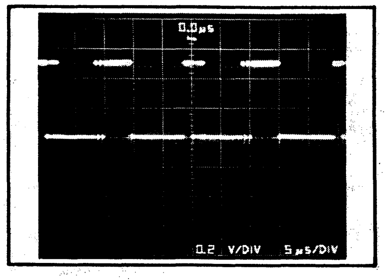

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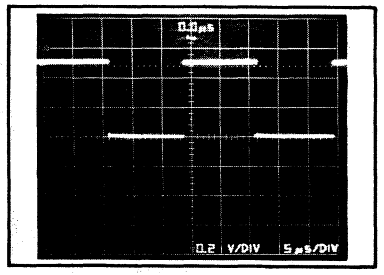
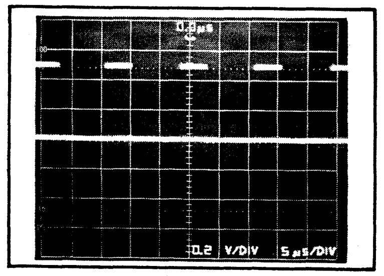


⓮



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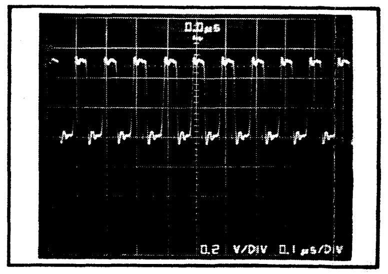

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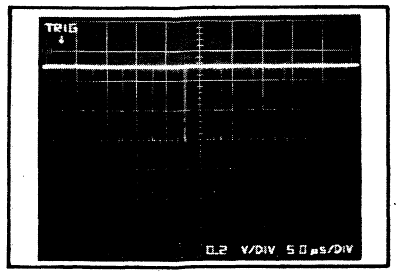

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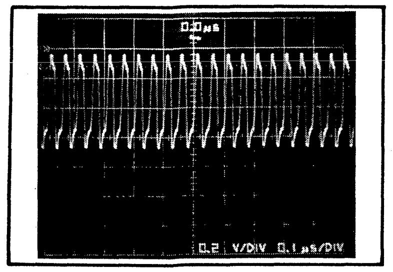

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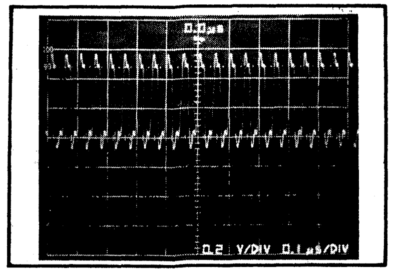

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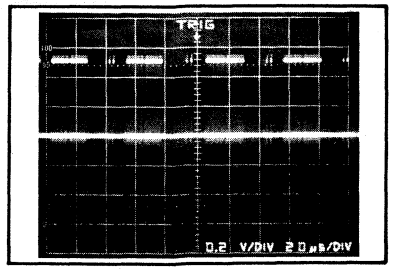
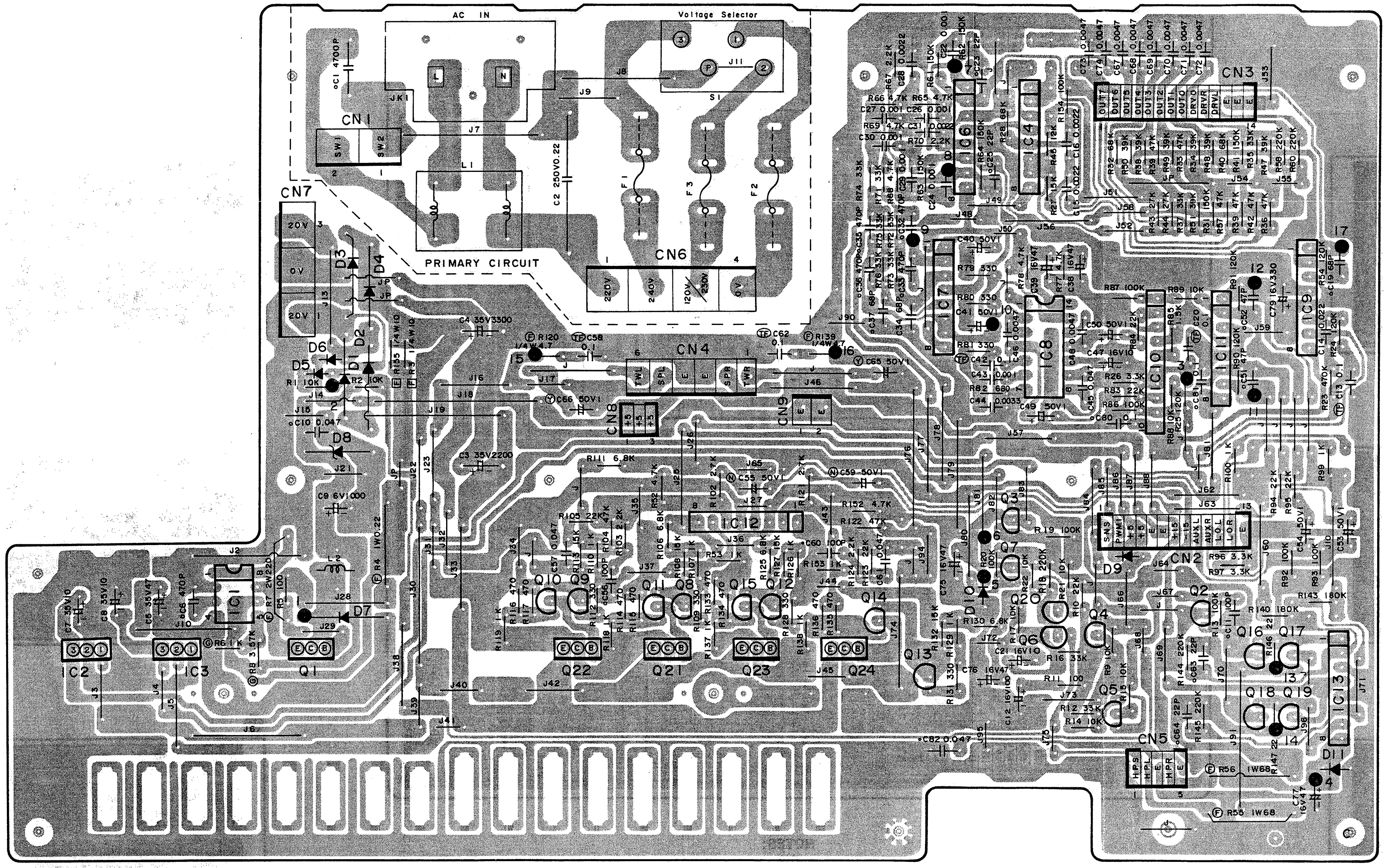


FAS HB FILTER & AMP AND HEADPHONES CIRCUIT BOARD

FAS


AC IN
Voltage Selector
JK1
CN1
SW1
SW2
L1
J7
J8
J9
J11
S1
F1
F2
F3
C1 4700P
C2 250V0.22
PRIMARY CIRCUIT
CN6
220V
240V
120V
100V
CN7
20V
0V
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
CN2
CN3
CN4
CN5
CN8
CN9
IC1
IC2
IC3
IC4
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q16
Q17
Q18
Q19
Q20
Q21
Q22
Q23
Q24

FAS P.C.B.

- [M] [XM] [MC] areas......... **SXPG206731A**
- [XR] area........................... **SXPG206741A**
- [XL] area............................ **SXPG206751A**
- [EK] [X] [XS] [XD] areas ... **SXPG206761A**
- Other areas **SXPG206711A**

HB **SXPG206711B**

FAS

NOTES:

- IC'S

IC1:	SVIGM5291P
IC2:	SVIGM5F7815
IC3:	SVIGM5F7915
IC4, 6, 7, 9, 11～13:	SVIGM5218L
IC8:	SVIGLM1894N
IC10:	SVIGM5241L

- TRANSISTORS

Q1:	2SA1643
Q2～4, 9, 10, 13, 14, 17, 19, 20	2SA1015-GR
Q5～8, 11, 12, 15, 16, 18:	2SC1815GR
Q21, 23:	2SA15670Y
Q22, 24:	2SC40640Y

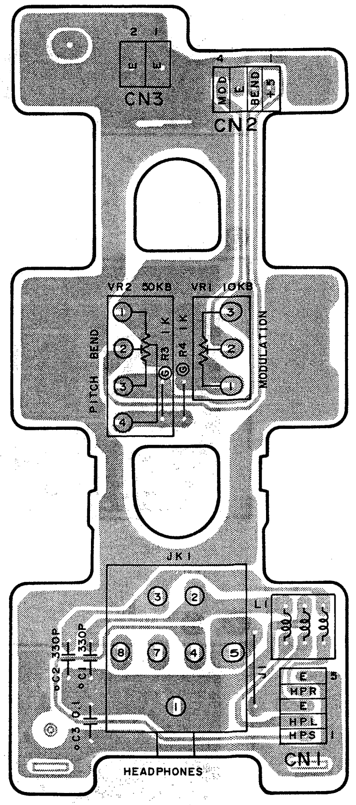
- DIODES

D1～4:	SVDS2V20
D5, 6:	SVDGERA1502Y
D7:	SVDGRK14S
D8:	MA2062LF
D9:	MA165TA5
D10, 11:	EK04

- FUSES

F1:	M XM MC	XBA1C16NU100
F1:	EK X XS XR XD	XBA2C12TB0
F2, 3:	EK X XS XR XD	XBA2C063TB0
F3: Others		XBA2C063TB0

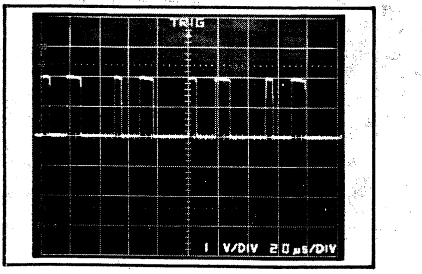
HB


CN3
CN2
MOD
BEND
VR2 50KB
VR1 10KB
PITCH BEND
MODULATION
JK1
HEADPHONES
CN1
HPR
HPL
HPS

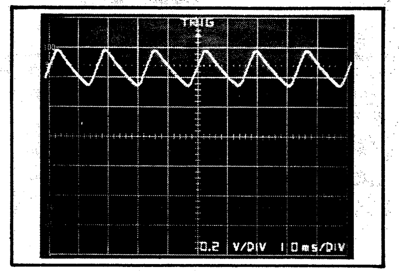
*FAS P.C.B. comparison chart by area about the primary circuit.

Ref. No. / Area	P.C.B. Part No.	JK1	S1	F1	F2	F3	J8	J9	J11	C1	C2	CN1, CN6, L1, J7
M, XM, MC	SXPG206731A	SJS9236	×	1.6A, 125V	×	×	×	○	×	4700pF	0.22μF, 250V	○
XR	SXPG206741A	SJSD16	○	T1.25A, 250V	T630mA, 250V	T630mA, 250V	○	×				
EK, X, XS, XD	SXPG206761A	SJS9236										
XL	SXPG206751A	SJSD16	×	×	×				○			
Others	SXPG206711A	SJS9236										

❶



❷ SNS



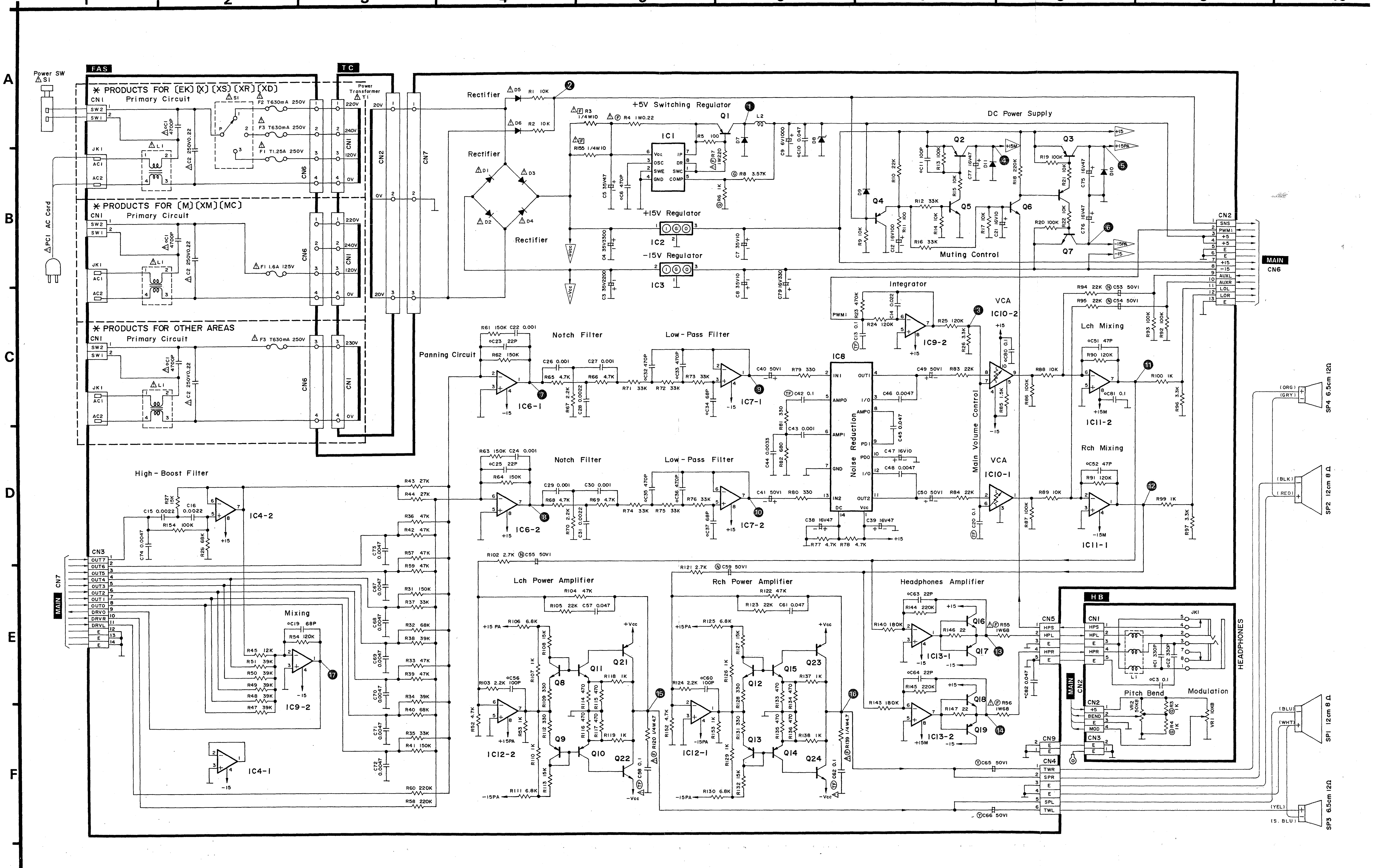
❸ **Main Vol. Control**

MAX .... −5mV
⟆ ⟆
MIN .... −165mV

❹

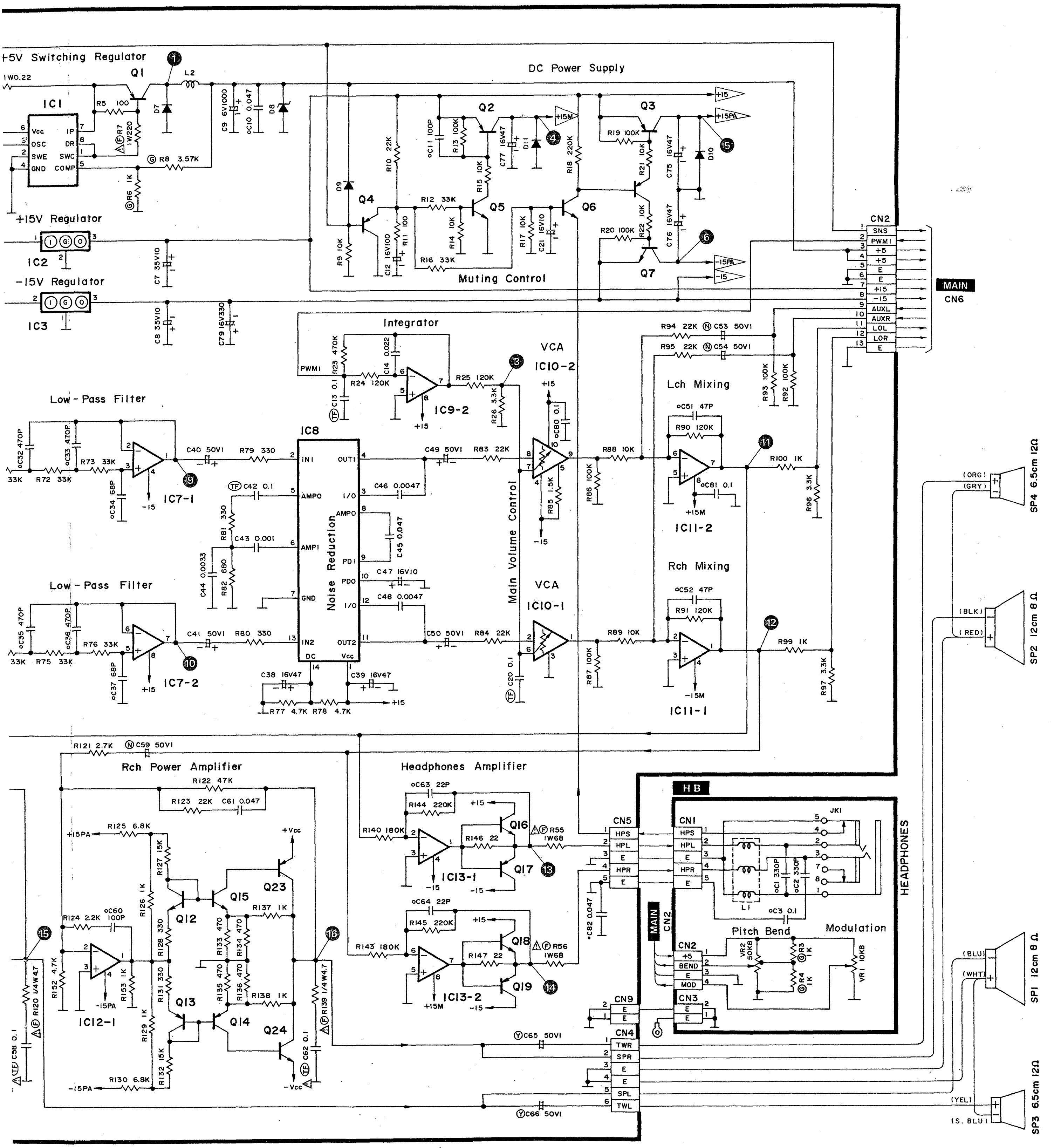
+15M

FAS **HB** FILTER & AMP AND HEADPHONES CIRCUIT DIAGRAM


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
Power SW
S1
FAS
TC
✻ PRODUCTS FOR (EK) (X) (XS) (XR) (XD)
✻ PRODUCTS FOR (M) (XM) (MC)
✻ PRODUCTS FOR OTHER AREAS
Primary Circuit
CN1
SW2
SW1
JK1
AC1
AC2
PC1 AC Cord
L1
C1 4700P
C2 250V0.22
F2 T630mA 250V
F3 T630mA 250V
F1 T1.25A 250V
F1 1.6A 125V
F3 T630mA 250V
CN6
CN1
Power Transformer
T1
220V
240V
120V
230V
0V
20V
CN2
CN7
Rectifier
D1
D2
D3
D4
D5
D6
R1 10K
R2 10K
+5V Switching Regulator
Q1
L2
R3 1/4W10
R4 1W0.22
R155 1/4W10
IC1
Vcc
OSC
SWE
GND
IP
DR
SWC
COMP
R5 100
R7 1W220
R8 3.57K
R6 1K
C5 35V47
C6 470P
D7
D8
C9 6V1000
C10 0.047
+15V Regulator
IC2
-15V Regulator
IC3
C4 35V3300
C3 35V2200
C7 35V10
C8 35V10
C79 16V330
+Vcc
-Vcc
DC Power Supply
Q2
Q3
Q4
Q5
Q6
Q7
D9
D10
D11
C11 100P
R10 22K
R13 100K
C77 16V47
R18 220K
R19 100K
R21 10K
C75 16V47
R12 33K
R15 10K
R14 10K
R11 100
C12 16V100
R9 10K
R16 33K
R17 10K
C21 16V10
R20 100K
R22 10K
C76 16V47
Muting Control
+15
+15M
+15PA
-15PA
-15
Integrator
PWM1
R23 470K
C14 0.022
R24 120K
C13 0.1
R25 120K
R26 3.3K
IC9-2
VCA
IC10-2
IC10-1
C80 0.1
R85 1.5K
Main Volume Control
C20 0.1
Lch Mixing
Rch Mixing
C51 47P
R90 120K
C81 0.1
IC11-2
C52 47P
R91 120K
IC11-1
R88 10K
R89 10K
R86 100K
R87 100K
R100 1K
R99 1K
R96 3.3K
R97 3.3K
R94 22K
C53 50V1
R95 22K
C54 50V1
R93 100K
R92 100K
CN2
SNS
PWM1
+5
E
+15
-15
AUXL
AUXR
LOL
LOR
MAIN
CN6
Panning Circuit
R61 150K
C22 0.001
C23 22P
R62 150K
IC6-1
R63 150K
C24 0.001
C25 22P
R64 150K
IC6-2
Notch Filter
C26 0.001
C27 0.001
R65 4.7K
R66 4.7K
R67 2.2K
C28 0.0022
R71 33K
R72 33K
C29 0.001
C30 0.001
R68 4.7K
R69 4.7K
R70 2.2K
C31 0.0022
R74 33K
R75 33K
Low-Pass Filter
C32 470P
C33 470P
R73 33K
C34 68P
IC7-1
C35 470P
C36 470P
R76 33K
C37 68P
IC7-2
C40 50V1
R79 330
C41 50V1
R80 330
IC8
IN1
OUT1
AMP0
AMP1
GND
IN2
OUT2
DC
Vcc
I/O
PD1
PD0
Noise Reduction
C42 0.1
C43 0.001
R81 330
R82 680
C44 0.0033
C45 0.047
C46 0.0047
C47 16V10
C48 0.0047
C38 16V47
C39 16V47
R77 4.7K
R78 4.7K
C49 50V1
R83 22K
C50 50V1
R84 22K
High-Boost Filter
R27 15K
C15 0.0022
C16 0.0022
R154 100K
R28 68K
C74 0.0047
IC4-2
IC4-1
CN3
OUT7
OUT6
OUT5
OUT4
OUT3
OUT2
OUT1
OUT0
DRV0
DRVR
DRVL
E
CN7
Mixing
C19 68P
R54 120K
R45 12K
R51 39K
R50 39K
R49 39K
R48 39K
R47 39K
IC9-2
R43 27K
R44 27K
R36 47K
R42 47K
C73 0.0047
R57 47K
R59 47K
C67 0.0047
R31 150K
R37 33K
C68 0.0047
R32 68K
R38 39K
C69 0.0047
R33 47K
R39 47K
C70 0.0047
R34 39K
R40 68K
C71 0.0047
R35 33K
R41 150K
C72 0.0047
R60 220K
R58 220K
R102 2.7K
C55 50V1
R121 2.7K
C59 50V1
Lch Power Amplifier
Rch Power Amplifier
R104 47K
R105 22K
C57 0.047
R122 47K
R123 22K
C61 0.047
R106 6.8K
R125 6.8K
R103 2.2K
C56 100P
R124 2.2K
C60 100P
R52 4.7K
R152 4.7K
R53 1K
R153 1K
IC12-2
IC12-1
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q21
Q22
Q23
Q24
R107 1K
R108 15K
R109 330
R110 1K
R111 6.8K
R112 330
R113 15K
R114 470
R115 470
R116 470
R117 470
R118 1K
R119 1K
R120 1/4W4.7
C58 0.1
R126 1K
R127 15K
R128 330
R129 1K
R130 6.8K
R131 330
R132 15K
R133 470
R134 470
R135 470
R136 470
R137 1K
R138 1K
R139 1/4W4.7
C62 0.1
Headphones Amplifier
C63 22P
R144 220K
R140 180K
R146 22
R55 1W68
IC13-1
Q16
Q17
C64 22P
R145 220K
R143 180K
R147 22
R56 1W68
IC13-2
Q18
Q19
C82 0.047
CN5
HPS
HPL
HPR
CN9
CN4
TWR
SPR
SPL
TWL
C65 50V1
C66 50V1
HB
CN1
JK1
C1 330P
C2 330P
C3 0.1
L1
HEADPHONES
Pitch Bend
Modulation
CN2
+5
BEND
MOD
VR2 50KB
R3 1K
R4 1K
VR1 10KB
CN3
(ORG)
(GRY)
SP4 6.5cm 12Ω
(BLK)
(RED)
SP2 12cm 8Ω
(BLU)
(WHT)
SP1 12cm 8Ω
(YEL)
(S. BLU)
SP3 6.5cm 12Ω
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰

RCUIT DIAGRAM

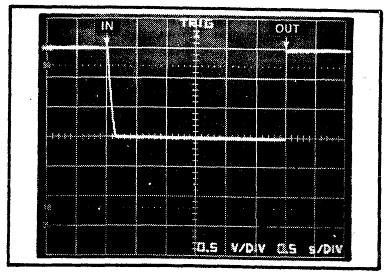
5 6 7 8 9 10 11 12 13 14


+5V Switching Regulator
Q1
L2
1W0.22
IC1
Vcc IP
OSC DR
SWE SWC
GND COMP
R5 100
R7 1W220
R8 3.57K
R6 1K
D7
D8
C9 6V1000
C10 0.047
+15V Regulator
IC2
−15V Regulator
IC3
C7 35V10
C8 35V10
C79 16V330
DC Power Supply
Q2
Q3
Q4
Q5
Q6
Q7
D9
D10
D11
R9 10K
R10 22K
R11 100
R12 33K
R13 100K
R14 10K
R15 10K
R16 33K
R17 10K
R18 220K
R19 100K
R20 100K
R21 10K
R22 10K
C11 100P
C12 16V100
C21 16V10
C75 16V47
C76 16V47
C77 16V47
Muting Control
+15
+15PA
+15M
−15PA
−15
CN2
SNS
PWM1
+5
+5
E
E
+15
−15
AUXL
AUXR
LOL
LOR
E
MAIN
CN6
Integrator
PWM1
R23 470K
R24 120K
C14 0.022
C15 0.1
IC9-2
R25 120K
R26 3.3K
VCA
IC10-2
R94 22K C53 50V1
R95 22K C54 50V1
R93 100K
R92 100K
Lch Mixing
C51 47P
R90 120K
IC11-2
R100 1K
R96 3.3K
Low-Pass Filter
C32 470P
C33 470P
R73 33K
R72 33K
C34 68P
IC7-1
C40 50V1
R79 330
IC8
IN1
OUT1
AMPO
I/O
AMPI
PDI
PDO
GND
IN2
OUT2
DC
Vcc
Noise Reduction
C42 0.1
R81 330
C43 0.001
C44 0.0033
R82 680
C45 0.047
C46 0.0047
C47 16V10
C48 0.0047
C49 50V1
R83 22K
Main Volume Control
R85 15K
R86 100K
R88 10K
C80 0.1
C81 0.1
Rch Mixing
C52 47P
R91 120K
IC11-1
R99 1K
R97 3.3K
VCA
IC10-1
C50 50V1
R84 22K
R89 10K
R87 100K
C20 0.1
Low-Pass Filter
C35 470P
C36 470P
R76 33K
R75 33K
C37 68P
IC7-2
C41 50V1
R80 330
C38 16V47
C39 16V47
R77 4.7K
R78 4.7K
R121 2.7K
C59 50V1
Rch Power Amplifier
R122 47K
R123 22K
C61 0.047
R125 6.8K
R127 15K
R126 1K
C60
R124 2.2K 100P
Q12
Q13
Q14
Q15
Q23
Q24
R128 330
R131 330
R129 1K
R132 15K
R130 6.8K
R133 470
R134 470
R135 470
R136 470
R137 1K
R138 1K
R152 4.7K
R153 1K
R120 1/4W4.7
R139 1/4W4.7
C58 0.1
C62 0.1
IC12-1
+Vcc
−Vcc
Headphones Amplifier
C63 22P
R144 220K
R140 180K
R146 22
Q16
Q17
R55 1W68
IC13-1
C64 22P
R145 220K
R143 180K
R147 22
Q18
Q19
R56 1W68
IC13-2
C82 0.047
C65 50V1
C66 50V1
CN5
HPS
HPL
E
HPR
E
CN9
CN4
TWR
SPR
E
E
SPL
TWL
HB
CN1
JK1
L1
C1 330P
C2 330P
C3 0.1
HEADPHONES
MAIN CN2
CN2
+5
BEND
E
MOD
CN3
Pitch Bend
VR2 50KB
R3 1K
R4 1K
Modulation
VR1 10KB
(ORG)
(GRY)
SP4 6.5cm 12Ω
(BLK)
(RED)
SP2 12cm 8Ω
(BLU)
(WHT)
SP1 12cm 8Ω
(YEL)
(S. BLU)
SP3 6.5cm 12Ω

■ Waveform measurement

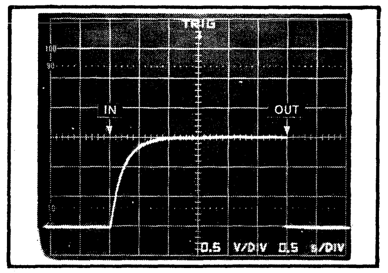
1. Activate the initial setting method. (Refer to page I-15)
2. Set the touch sensitivity level to the "0". (Refer to page I-15)
3. Set the keyboard to the required mode followings.
   - •SOUND SELECT .... FLUTE
   - •SOUND VARIATION 1
   - •DIGITAL REVERB .... OFF
   - •MAIN VOLUME .... MAX
   - •Key .... C4 Key

⑤ +15PA



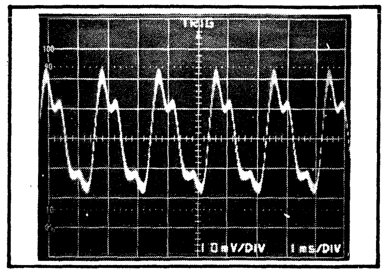
• Headphones plug..............IN → OUT

⑥ −15PA



• Headphones plug..............IN → OUT

⑦



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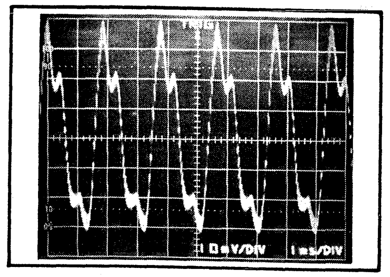
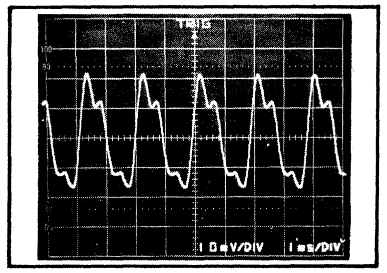


⑨



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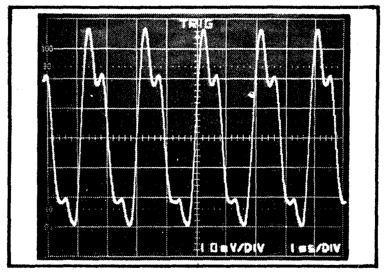

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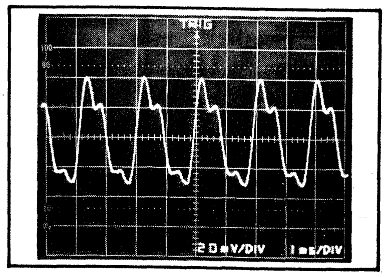
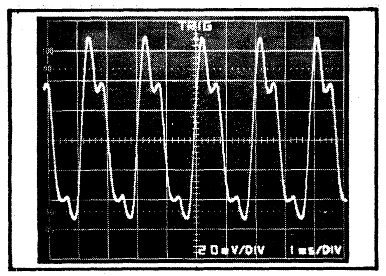
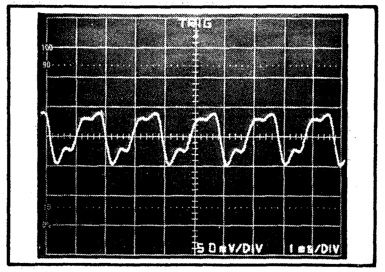


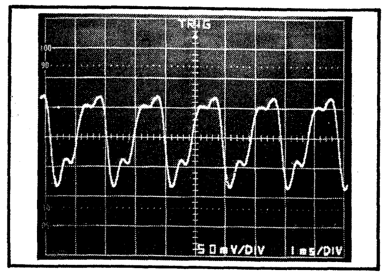
⑫



⑬



⑭



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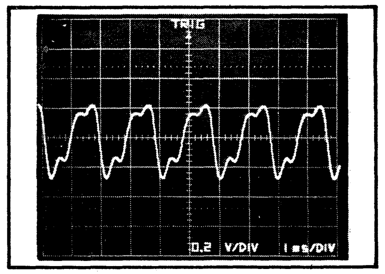

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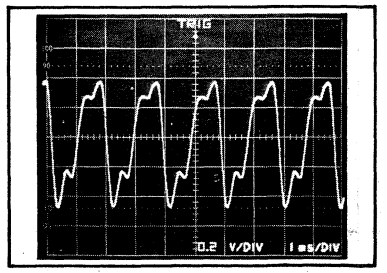

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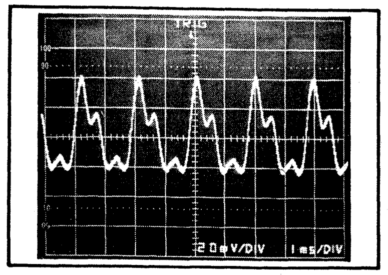
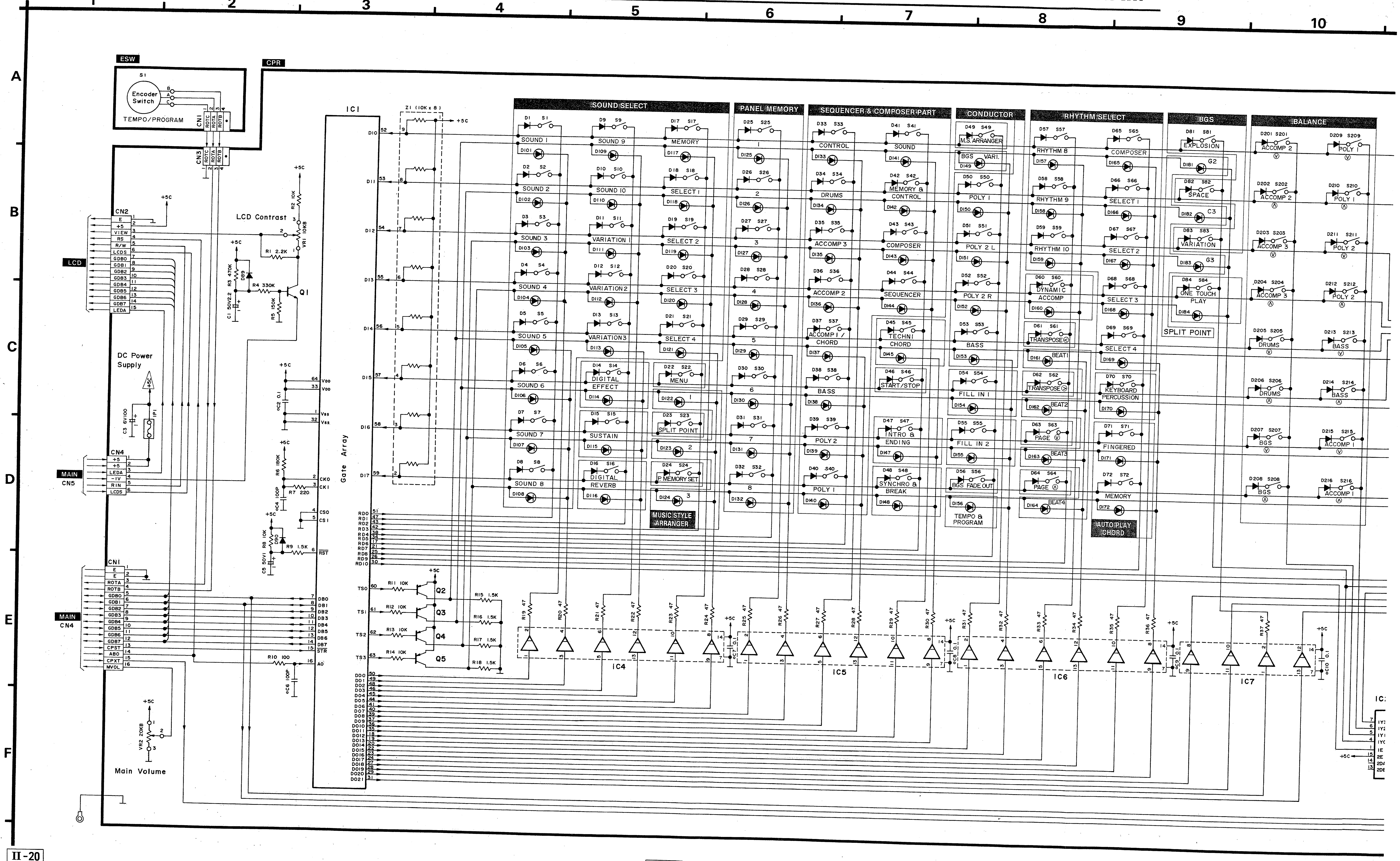


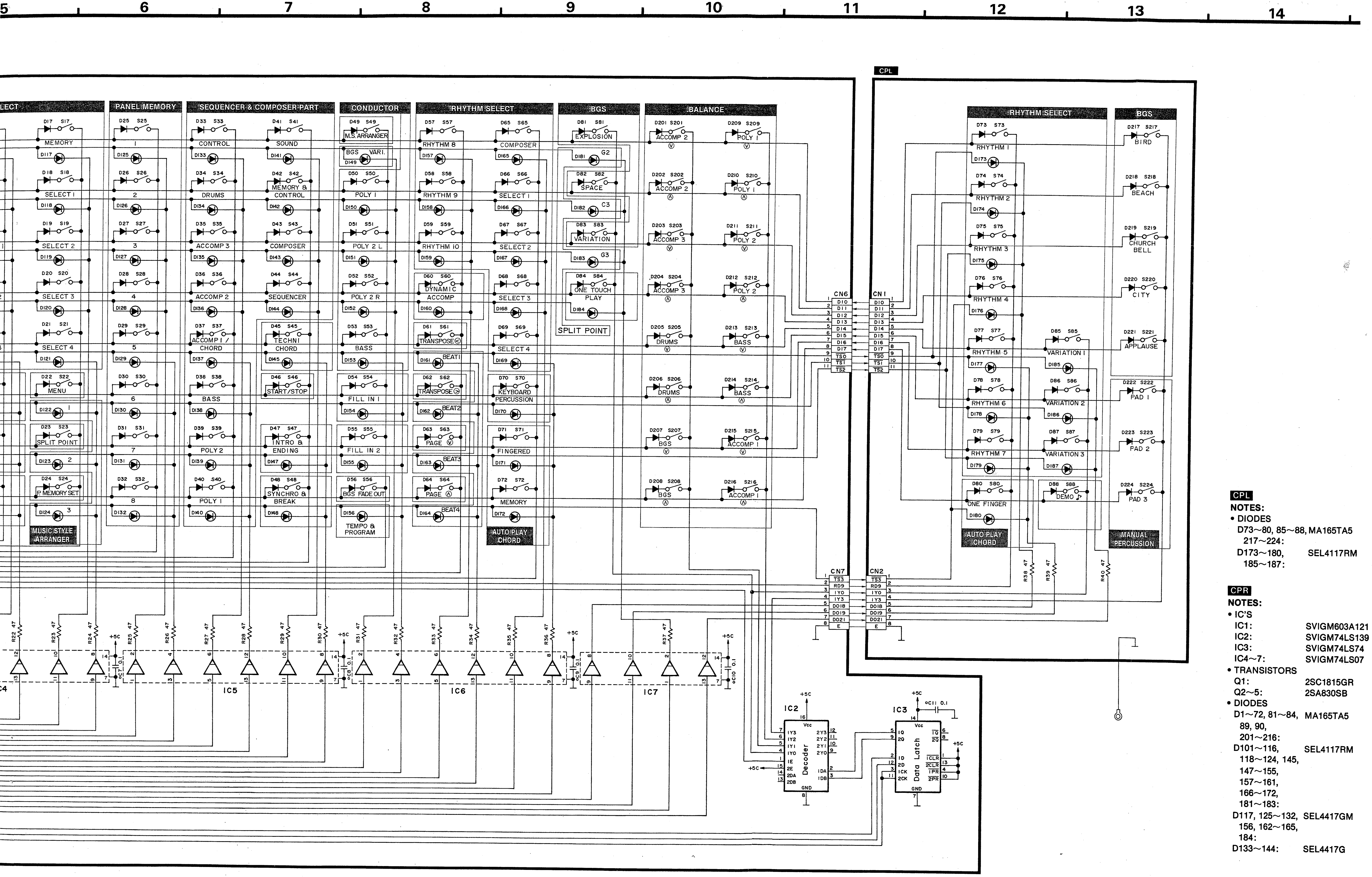
CPL **CPR** **ESW**

CONTROL PANEL LEFT, RIGHT AND ENCODER SWITCH CIRCUIT DIAGRAM



1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
ESW
S1
Encoder Switch
TEMPO/PROGRAM
CN1
ROTC
ROTA
ROTB
CPR
CN3
IC1
Gate Array
Z1 (10K x 8)
+5C
LCD Contrast
VR1 10KB
R1 2.2K
R2 10K
R3 470K
R4 330K
R5 150K
D89
Q1
C1 50V2.2
CN2
LCD
E
+5
VIEW
RS
R/W
LCDS
GDB0
GDB1
GDB2
GDB3
GDB4
GDB5
GDB6
GDB7
LEDA
DC Power Supply
IP1
C3 6V100
C2 0.1
CN4
MAIN
CN5
-1V
RIN
R6 180K
R7 220
C4 100P
R8 10K
R9 1.5K
D90
C5 50V1
CN1
CN4
ROTA
ROTB
CPST
AB0
CPXT
MVOL
R10 100
C6 100P
VR2 20KB
Main Volume
VDD
VSS
CK0
CK1
CS0
CS1
RST
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
STR
A0
DI0
DI1
DI2
DI3
DI4
DI5
DI6
DI7
RD0
RD1
RD2
RD3
RD4
RD5
RD6
RD7
RD8
RD9
RD10
TS0
TS1
TS2
TS3
R11 10K
R12 10K
R13 10K
R14 10K
Q2
Q3
Q4
Q5
R15 1.5K
R16 1.5K
R17 1.5K
R18 1.5K
DO0
DO1
DO2
DO3
DO4
DO5
DO6
DO7
DO8
DO9
DO10
DO11
DO12
DO13
DO14
DO15
DO16
DO17
DO19
DO20
DO21
SOUND SELECT
SOUND 1
SOUND 2
SOUND 3
SOUND 4
SOUND 5
SOUND 6
SOUND 7
SOUND 8
SOUND 9
SOUND 10
VARIATION 1
VARIATION 2
VARIATION3
DIGITAL EFFECT
SUSTAIN
DIGITAL REVERB
MEMORY
SELECT 1
SELECT 2
SELECT 3
SELECT 4
MENU
SPLIT POINT
P MEMORY SET
MUSIC STYLE ARRANGER
PANEL MEMORY
SEQUENCER & COMPOSER PART
CONTROL
DRUMS
ACCOMP 3
ACCOMP 2
ACCOMP 1 / CHORD
BASS
POLY 2
POLY 1
SOUND
MEMORY & CONTROL
COMPOSER
SEQUENCER
TECHNI CHORD
START/STOP
INTRO & ENDING
SYNCHRO & BREAK
CONDUCTOR
M.S. ARRANGER
BGS VARI.
POLY 1
POLY 2 L
POLY 2 R
BASS
FILL IN 1
FILL IN 2
BGS FADE OUT
TEMPO & PROGRAM
RHYTHM SELECT
RHYTHM 8
RHYTHM 9
RHYTHM 10
DYNAMIC ACCOMP
TRANSPOSE ⊙
BEAT1
TRANSPOSE ⊗
BEAT2
PAGE ⓥ
BEAT3
PAGE Ⓐ
BEAT4
COMPOSER
SELECT 1
SELECT 2
SELECT 3
SELECT 4
KEYBOARD PERCUSSION
FINGERED
MEMORY
AUTO PLAY CHORD
BGS
EXPLOSION
G2
SPACE
C3
VARIATION
G3
ONE TOUCH PLAY
SPLIT POINT
BALANCE
ACCOMP 2 ⓥ
ACCOMP 2 Ⓐ
ACCOMP 3 ⓥ
ACCOMP 3 Ⓐ
DRUMS ⓥ
DRUMS Ⓐ
BGS ⓥ
BGS Ⓐ
POLY 1 ⓥ
POLY 1 Ⓐ
POLY 2 ⓥ
POLY 2 Ⓐ
BASS ⓥ
BASS Ⓐ
ACCOMP 1 ⓥ
ACCOMP 1 Ⓐ
R19 47
R20 47
R21 47
R22 47
R23 47
R24 47
R25 47
R26 47
R27 47
R28 47
R29 47
R30 47
R31 47
R32 47
R33 47
R34 47
R35 47
R36 47
R37 47
C7 0.1
C8 0.1
C9 0.1
C10 0.1
IC4
IC5
IC6
IC7
1Y3
1Y2
1Y1
1Y0
1E
2E
2DA
2DB

HT AND ENCODER SWITCH CIRCUIT DIAGRAM


5
6
7
8
9
10
11
12
13
14
LECT
PANEL MEMORY
SEQUENCER & COMPOSER PART
CONDUCTOR
RHYTHM SELECT
BGS
BALANCE
CPL
RHYTHM SELECT
BGS
MEMORY
SELECT 1
SELECT 2
SELECT 3
SELECT 4
MENU
SPLIT POINT
P.MEMORY SET
MUSIC STYLE ARRANGER
CONTROL
SOUND
DRUMS
MEMORY & CONTROL
ACCOMP 3
COMPOSER
ACCOMP 2
SEQUENCER
ACCOMP 1 / CHORD
TECHNI CHORD
BASS
START/STOP
POLY 2
INTRO & ENDING
POLY 1
SYNCHRO & BREAK
M.S.ARRANGER
BGS VARI.
POLY 1
POLY 2 L
POLY 2 R
BASS
FILL IN 1
FILL IN 2
BGS FADE OUT
TEMPO & PROGRAM
RHYTHM 8
RHYTHM 9
RHYTHM 10
DYNAMIC ACCOMP
TRANSPOSE
BEAT1
BEAT2
PAGE
BEAT3
BEAT4
COMPOSER
SELECT 1
SELECT 2
SELECT 3
SELECT 4
KEYBOARD PERCUSSION
FINGERED
MEMORY
AUTO PLAY CHORD
EXPLOSION
G2
SPACE
C3
VARIATION
G3
ONE TOUCH PLAY
SPLIT POINT
ACCOMP 2
ACCOMP 3
DRUMS
BGS
POLY 1
POLY 2
BASS
ACCOMP 1
CN6
CN1
CN7
CN2
RHYTHM 1
RHYTHM 2
RHYTHM 3
RHYTHM 4
RHYTHM 5
RHYTHM 6
RHYTHM 7
ONE FINGER
VARIATION 1
VARIATION 2
VARIATION 3
DEMO
AUTO PLAY CHORD
BIRD
BEACH
CHURCH BELL
CITY
APPLAUSE
PAD 1
PAD 2
PAD 3
MANUAL PERCUSSION
IC4
IC5
IC6
IC7
IC2
Decoder
IC3
Data Latch
+5C

CPL

NOTES:

- DIODES
  D73~80, 85~88, 217~224: MA165TA5
  D173~180, 185~187: SEL4117RM

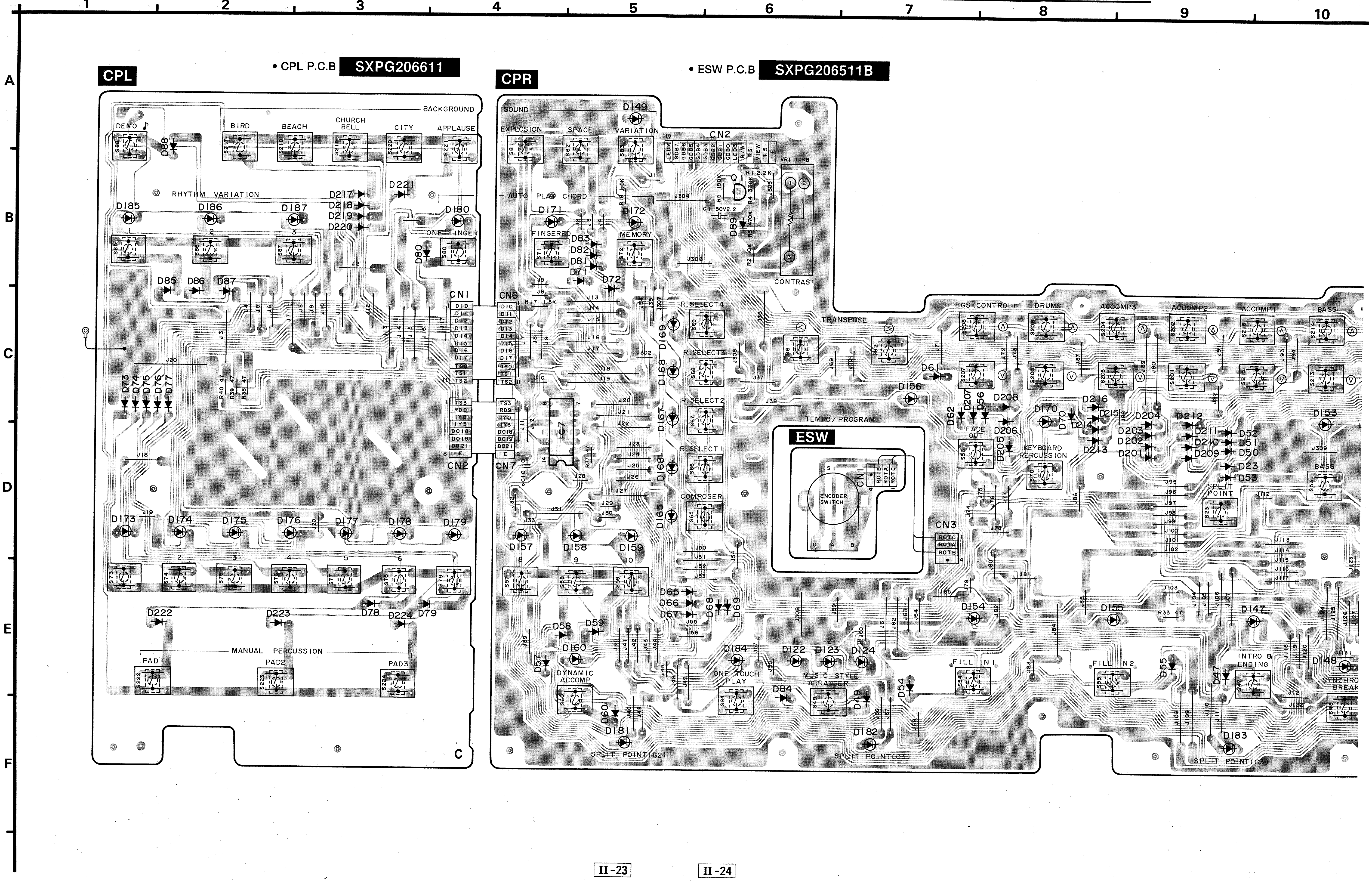
CPR

NOTES:

- IC'S
  IC1: SVIGM603A121
  IC2: SVIGM74LS139
  IC3: SVIGM74LS74
  IC4~7: SVIGM74LS07
- TRANSISTORS
  Q1: 2SC1815GR
  Q2~5: 2SA830SB
- DIODES
  D1~72, 81~84, 89, 90, 201~216: MA165TA5
  D101~116, 118~124, 145, 147~155, 157~161, 166~172, 181~183: SEL4117RM
  D117, 125~132, 156, 162~165, 184: SEL4417GM
  D133~144: SEL4417G

CPL **CPR** **ESW**

CONTROL PANEL LEFT, RIGHT AND ENCODER SWITCH CIRCUIT BOARD

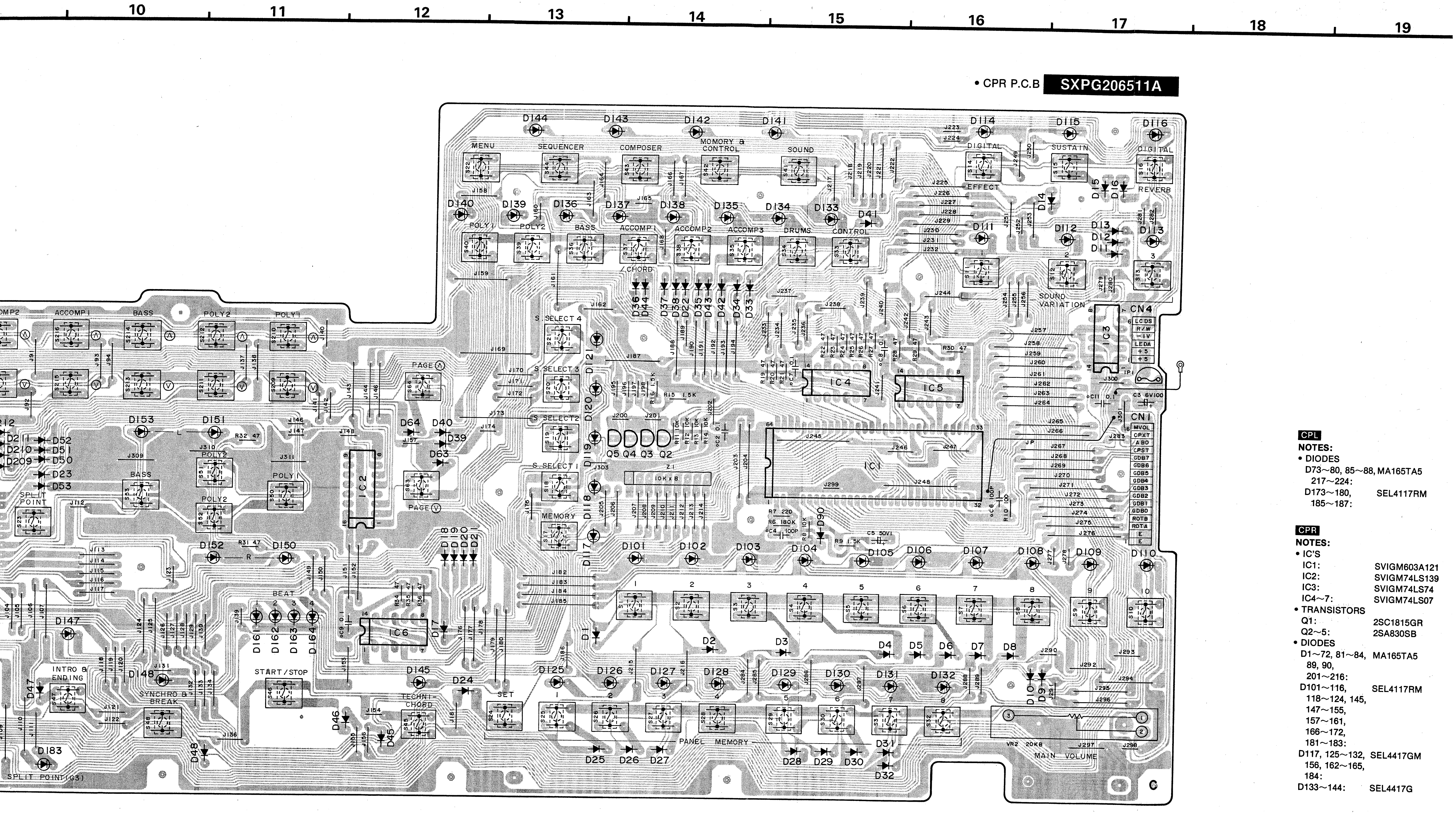


• CPL P.C.B **SXPG206611**

• ESW P.C.B **SXPG206511B**

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
CPL
CPR
ESW
BACKGROUND
DEMO
BIRD
BEACH
CHURCH BELL
CITY
APPLAUSE
S88
D88
S217
S218
S219
S220
S221
RHYTHM VARIATION
D217
D218
D219
D220
D221
D185
D186
D187
D180
ONE FINGER
S85
S86
S87
S80
D80
D85
D86
D87
J2
J3
CN1
D10
D11
D12
D13
D14
D15
D16
D17
TS0
TS1
TS2
TS3
RD9
IY0
IY3
DO18
DO19
DO21
E
CN2
J20
D73
D74
D75
D76
D77
R40 47
R39 47
R38 47
J18
J19
D173
D174
D175
D176
D177
D178
D179
S73
S74
S75
S76
S77
S78
S79
D78
D79
D222
D223
D224
MANUAL PERCUSSION
PAD1
PAD2
PAD3
S222
S223
S224
C
SOUND
D149
EXPLOSION
SPACE
VARIATION
S81
S82
S83
CN2
LEDA
GDB7
GDB6
GDB5
GDB4
GDB3
GDB2
GDB1
GDB0
LCD3
R/W
RS
VIEW
+5
E
VR1 10KB
R1 2.2K
R5 150K
R4 330K
R3 470K
R2 10K
R18 1.5K
C1 50V2.2
D89
J304
J305
J306
CONTRAST
AUTO PLAY CHORD
D171
D172
FINGERED
MEMORY
S71
S72
D83
D82
D81
D71
D72
CN6
CN7
R17 1.5K
J5
J6
J7
J8
J9
J10
J11
J12
J13
J14
J15
J16
J17
J21
J22
J23
J24
J25
J26
J27
J28
J29
J30
J31
J32
J33
J34
J35
J36
J37
J38
J302
J307
J308
IC7
R37 47
C10
R.SELECT4
R.SELECT3
R.SELECT2
R.SELECT1
COMPOSER
S69
S68
S67
S66
S65
D169
D168
D167
D165
TRANSPOSE
S61
S62
D61
D156
TEMPO/PROGRAM
ENCODER SWITCH
S1
CN1
ROTB
ROTA
ROTC
CN3
D157
D158
D159
S57
S58
S59
J50
J51
J52
J53
J54
J55
J56
D65
D66
D67
D68
D69
D58
D59
D160
D57
DYNAMIC ACCOMP
S60
D60
D181
SPLIT POINT(G2)
D184
ONE TOUCH PLAY
S84
D84
D122
D123
D124
MUSIC STYLE ARRANGER
S49
D49
D54
D182
SPLIT POINT(C3)
D154
FILL IN1
S54
D155
FILL IN2
S55
D55
D47
INTRO & ENDING
S47
D147
D148
SYNCHRO BREAK
D183
SPLIT POINT(G3)
BGS (CONTROL)
DRUMS
ACCOMP3
ACCOMP2
ACCOMP1
BASS
S208
S207
S206
S205
S204
S203
S202
S201
S216
S215
S214
S213
D62
D207
D56
D208
D206
D205
FADE OUT
S56
D170
D70
KEYBOARD PERCUSSION
S70
D216
D215
D214
D213
D204
D203
D202
D201
D212
D211
D210
D209
D52
D51
D50
D23
D53
D153
J309
BASS
S53
SPLIT POINT
S23
R33 47

• CPR P.C.B **SXPG206511A**


10
11
12
13
14
15
16
17
18
19
MENU
SEQUENCER
COMPOSER
MEMORY & CONTROL
SOUND
DIGITAL EFFECT
SUSTAIN
DIGITAL REVERB
POLY1
POLY2
BASS
ACCOMP1
ACCOMP2
ACCOMP3
DRUMS
CONTROL
/CHORD
SOUND VARIATION
CN4
CN1
IC1
IC2
IC3
IC4
IC5
IC6
Z1
Q5 Q4 Q3 Q2
S. SELECT 4
S. SELECT 3
S. SELECT 2
S. SELECT 1
MEMORY
PAGE
SPLIT POINT
INTRO & ENDING
SYNCHRO & BREAK
START/STOP
BEAT
TECHNI CHORD
SET
PANEL MEMORY
VR2 20KB
MAIN VOLUME
SPLIT POINT(G3)
LCDS
R/W
-1V
LEDA
+5
MVOL
CPXT
ABO
CPST
GDB7
GDB6
GDB5
GDB4
GDB3
GDB2
GDB1
GDB0
ROTB
ROTA
E

CPL

NOTES:

• DIODES

D73~80, 85~88, 217~224:	MA165TA5
D173~180, 185~187:	SEL4117RM

CPR

NOTES:

• IC'S

IC1:	SVIGM603A121
IC2:	SVIGM74LS139
IC3:	SVIGM74LS74
IC4~7:	SVIGM74LS07

• TRANSISTORS

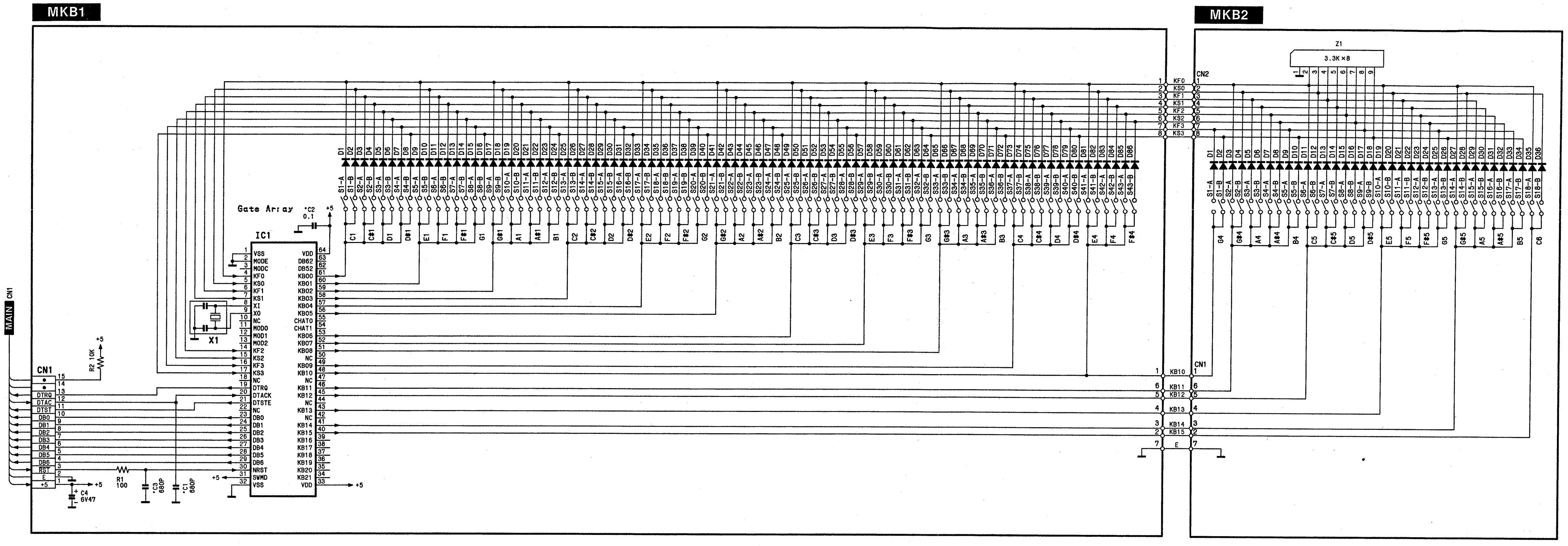
Q1:	2SC1815GR
Q2~5:	2SA830SB

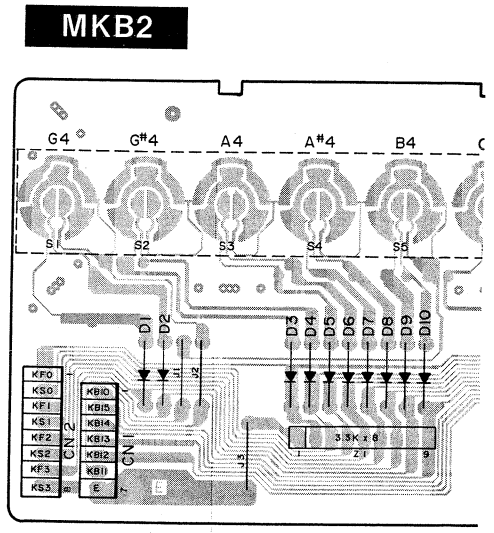
• DIODES

D1~72, 81~84, 89, 90, 201~216:	MA165TA5
D101~116, 118~124, 145, 147~155, 157~161, 166~172, 181~183:	SEL4117RM
D117, 125~132, 156, 162~165, 184:	SEL4417GM
D133~144:	SEL4417G

MKB1 **MKB2**

MANUAL KEYBOARD 1, 2 CIRCUIT DIAGRAM AND CIRCUIT BOARD

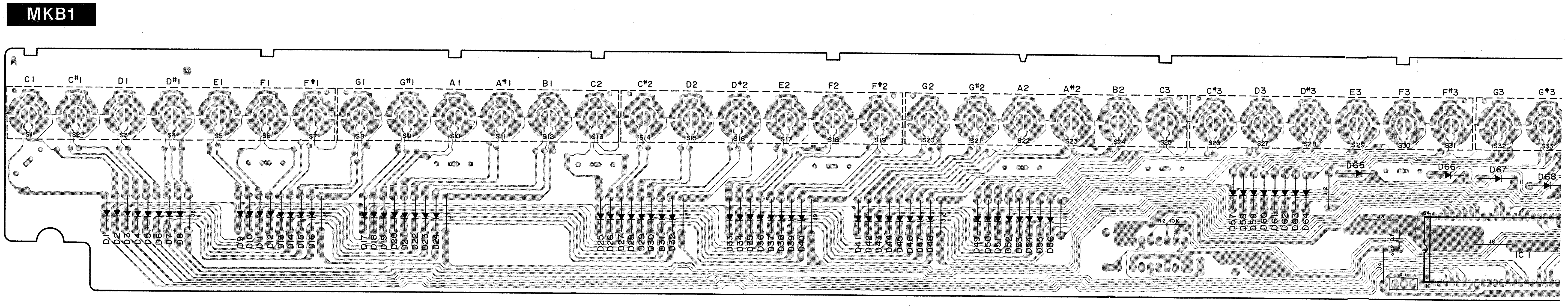

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
MKB1
MKB2
Gate Array
IC1
C2 0.1
X1
CN1
CN2
MAIN CN1
R2 10K
R1 100
C4 6V47
C3 680P
C1 680P
Z1
3.3K×8
KF0
KS0
KF1
KS1
KF2
KS2
KF3
KS3
KB10
KB11
KB12
KB13
KB14
KB15
E
DTRQ
DTAC
DTST
DB0
DB1
DB2
DB3
DB4
DB5
DB6
RST
+5


MKB2
G4
G#4
A4
A#4
B4
S1
S2
S3
S4
S5
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
CN2
CN1
3.3K×8
Z1
KF0
KS0
KF1
KS1
KF2
KS2
KF3
KS3
KB10
KB15
KB14
KB13
KB12
KB11
E

MKB1

NOTES:

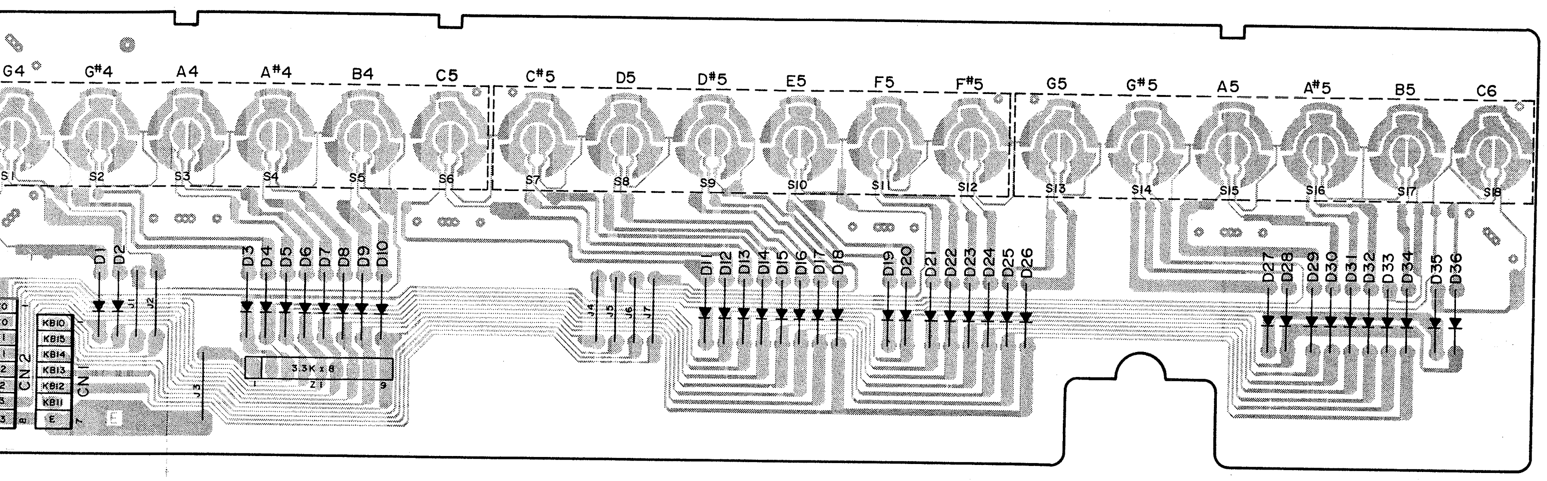
- IC'S
  IC1:
- DIODES
  D1～87:


MKB1
C1
C#1
D1
D#1
E1
F1
F#1
G1
G#1
A1
A#1
B1
C2
C#2
D2
D#2
E2
F2
F#2
G2
G#2
A2
A#2
B2
C3
C#3
D3
D#3
E3
F3
F#3
G3
G#3
S1
S33
D1
D64
D65
D66
D67
D68
R2 10K
IC1
X1

10 11 12 13 14

MKB2

SXPG143611


G4
G#4
A4
A#4
B4
C5
C#5
D5
D#5
E5
F5
F#5
G5
G#5
A5
A#5
B5
C6
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
S17
S18
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
D14
D15
D16
D17
D18
D19
D20
D21
D22
D23
D24
D25
D26
D27
D28
D29
D30
D31
D32
D33
D34
D35
D36
3.3K x 8
Z1
CN2
CN1

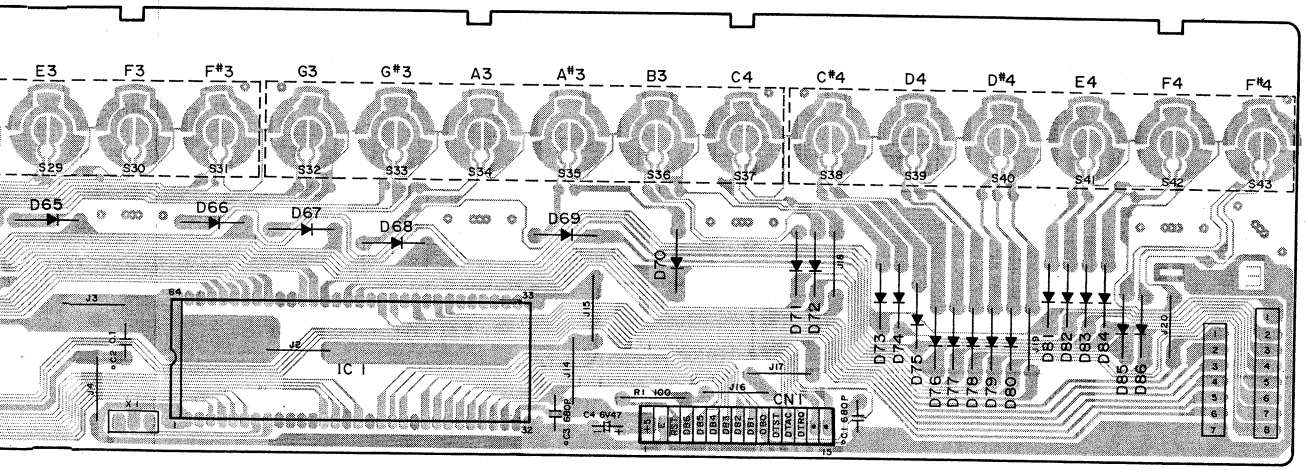
MKB1

NOTES:
- IC'S
  IC1: MN50020PGV
- DIODES
  D1~87: MA162A

MKB2

NOTES:
- DIODES
  D1~36: MA162A

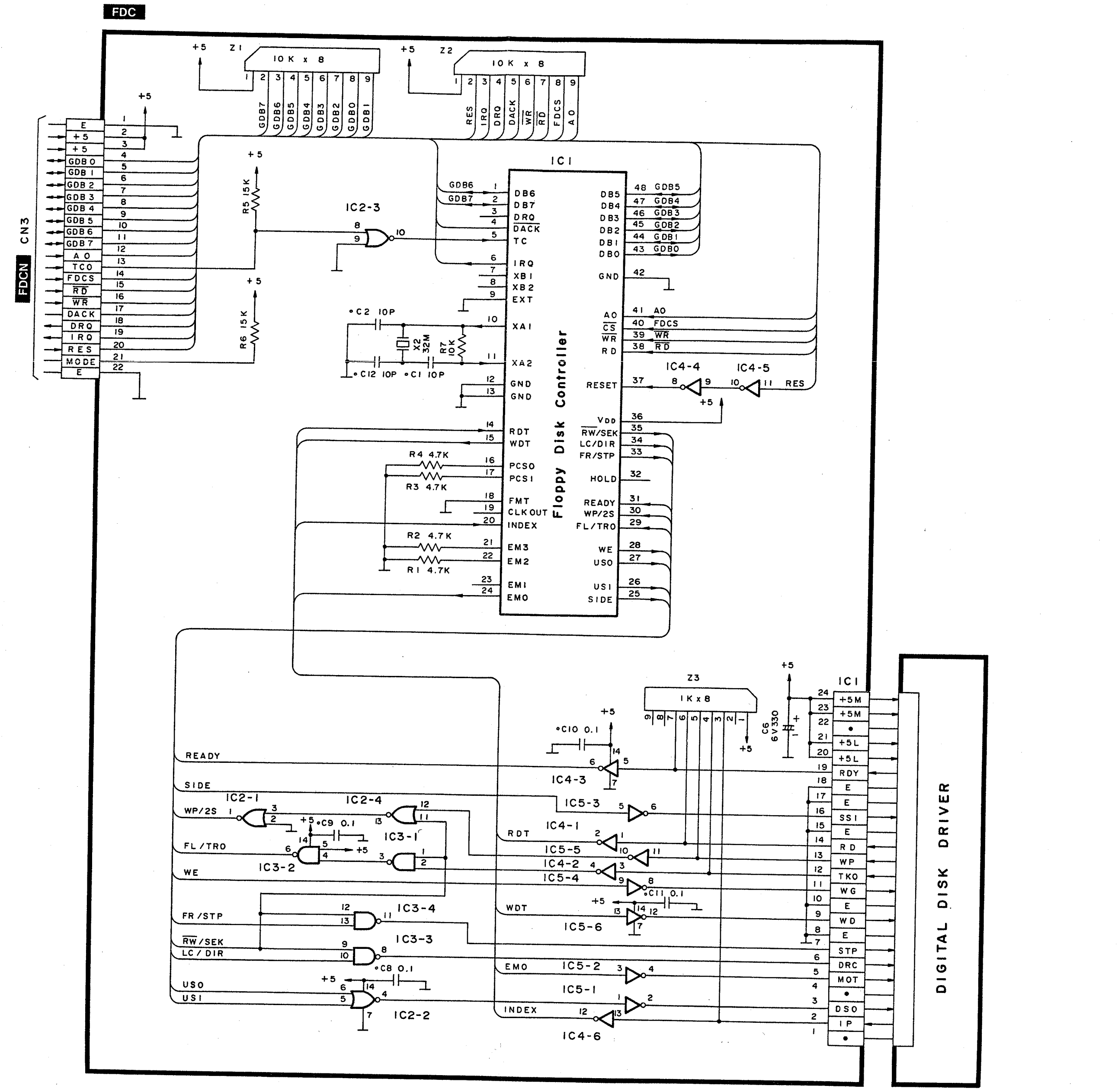
SXPG143521


E3
F3
F#3
G3
G#3
A3
A#3
B3
C4
C#4
D4
D#4
E4
F4
F#4
S29
S30
S31
S32
S33
S34
S35
S36
S37
S38
S39
S40
S41
S42
S43
D65
D66
D67
D68
D69
D70
D71
D72
D73
D74
D75
D76
D77
D78
D79
D80
D81
D82
D83
D84
D85
D86
IC1
X1
R1 100
CN1

FDC FD CONTROL CIRCUIT (ONLY FOR EZ, EW AREAS)

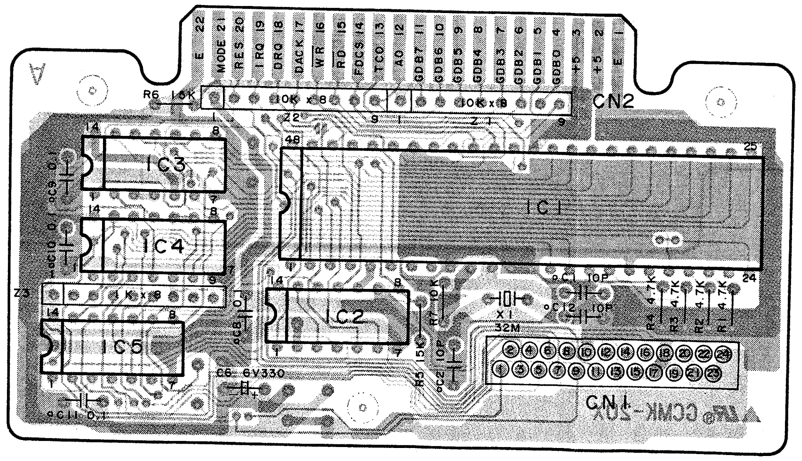
1 2 3 4 5

A B C D E F


FDC
Z1
10K x 8
Z2
10K x 8
+5
IC1
Floppy Disk Controller
IC2-3
IC2-1
IC2-2
IC2-4
IC3-1
IC3-2
IC3-3
IC3-4
IC4-1
IC4-2
IC4-3
IC4-4
IC4-5
IC4-6
IC5-1
IC5-2
IC5-3
IC5-4
IC5-5
IC5-6
R1 4.7K
R2 4.7K
R3 4.7K
R4 4.7K
R5 15K
R6 15K
X2 32M
C2 10P
C1 10P
C12 10P
C9 0.1
C8 0.1
C10 0.1
C11 0.1
C6 6V330
Z3
1K x 8
CN3
FDCN
READY
SIDE
WP/2S
FL/TRO
WE
FR/STP
RW/SEK
LC/DIR
US0
US1
RDT
WDT
EMO
INDEX
DIGITAL DISK DRIVER

Circuit view on top of P.C.B.

SXPG208311


IC1
IC2
IC3
IC4
IC5
CN1
CN2
R6 15K
10K x 8
X1 32M
Z3
CCMK-20X

NOTES:
- IC'S

IC1:	SVIGD72067C
IC2:	SVIGM74H02
IC3:	SVIGM74H00
IC4:	SVIGM74H14
IC5:	SVIGM74H04

REPLACEMENT PARTS LIST......P.C.B. and Wiring Parts

Notes:

1. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4. ○ mark are new parts.
5. For part No. with area mark, check the area when placing an order.

■ PRINTED CIRCUIT BOARD

	NLA	Area	Part No.	Description	Per/Set
○	NLA	M XM	SXPG206421	MAIN	1
○	NLA	Others	SXPG206411	MAIN	1
Ⓢ	NLA		SXPG208721	FDCN	1
○	NLA		SXPG146071	DRV	1
○	NLA	M MC XM	SXPG206731A	FAS	1
○	NLA	XR	SXPG206741A	FAS	1
○	NLA	XL	SXPG206751A	FAS	1
○	NLA	EK X XS XD	SXPG206761A	FAS	1
○	NLA	Others	SXPG206711A	FAS	1
○	NLA		SXPG206711B	HB	1
○	NLA		SXPG206611	CPL	1
○	NLA		SXPG206511A	CPR	1
○	NLA		SXPG206511B	ESW	1
	NLA		SXPG143521	MKB1	1
	NLA		SXPG143611	MKB2	1
○	NLA	EZ EW	SXPG208311	FDC	1

MAIN MAIN CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
	INTEGRATED CIRCUITS			
	IC1	SVIGD70320GJ	16 bit Microcomputer	1
	IC2	SVIGMB621407	Gate Array	1
	IC3	SVIGMSM6253	A/D Converter	1
	IC4	SVIGTLP513	Photo Coupler	1
○	IC5	QSIGBKN10BX0	2M bit Programmed EP ROM	1
○	IC6	QSIGBKN10AX0	2M bit Programmed EP ROM	1
	IC7, 8	SVIGD43256AL	256k bit Static RAM	2
	IC9	SVIGHM65256	256k bit Pseudo Static RAM	1
○	IC10	QSIGH3C08C11	8M bit ACCOMP Pattern ROM	1
○	IC11	M74HC04FP	Hex Inverters	1
○	IC12, 13	M74HC32FP	Quad 2-input OR Gates	2
	IC14	MN73012PGC	Tone Generator LSI 1	1
	IC15	MN73013PGD	Tone Generator LSI 2	1
○	IC16	QSIGH3C08D48	8M bit Wave ROM	1
○	IC17	QSIGU3C08066	8M bit Wave ROM	1
○	IC18	QSIGU3C08065	8M bit Wave ROM	1
	IC19	SVIGPCM54	D-A Converter	1
○	IC20, 21	T74H4051AF	8-channel Multiplexer	2
○	IC22	M5238FP	Operational Amplifier	1
○	IC24, 25	M74HC00FP	Quad 2-input NAND Gates	2
	TRANSISTORS			
S	Q1, 2, 8	2SA1015-GR	2SA933STRS (SUB. Part)	3
	DIODES			
	D1~15, 19	MA165TA5		16
	D17, 18	MA4051MTA	Zener, 5.1V	2
	D20	MA4056H	Zener, 5.8V	1
	OSCILLATORS			
	X1	QSXG1A1400A	14MHz, Quartz Oscillator	1
	X2	QSXG1B4000B	40MHz, Quartz Oscillator	1
	COMPONENT COMBINATIONS			
	Z1~3	EXBPI8472JM	4.7kΩ×8	3
	Z5	EXAMR14A1002	1kΩ/2kΩ, Ladder Network	1
	ZC1, 2	EXFP8101MW	100pF×8	2
	COILS			
	L1, 3~7, 10, 13~15, 18, 19, 22, 24, 25	QLQGT3T150SA	Coil	15
	L2, 8, 9, 17	QLQGT2T150SA	Coil	4
	L11, 16, 20, 21, 23, 26~28	QLQGT1B600MA	Coil	8
	L12	SLQG15W14D	Coil	1
	JACKS			
	JK1	SJJG100A	EXP PEDAL	1
○	JK2, 6~9	QJJG003AA	FOOT SW, AUX IN, LINE OUT	5
	JK3~5	SJSG1370A	MIDI	3
	SEMI-FIXED RESISTOR			
	VR1	EVND4AA00B14	10kΩ B, Offset Adj.	1
	RESISTORS			
	R1	ERDS2TJ104	100kΩ	1
	R2	ERDS2TJ222	2.2kΩ	1
	R3, 4	ER0S2CKF1001	1kΩ, ±1%	2
	R5	ERDS2TJ103	10kΩ	1
	R6	ER0S2CKF1001	1kΩ, ±1%	1
	R7	ERDS2TJ103	10kΩ	1
	R8	ERDS2TJ680	68Ω	1
	R9	ERDS2TJ221	220Ω	1
	R10	ERDS2TJ104	100kΩ	1
	R11	ERDS2TJ151	150Ω	1
	R12	ERDS2TJ103	10kΩ	1
	R13	ERDS2TJ680	68Ω	1
	R14	ERDS2TJ221	220Ω	1
	R15	ERDS2TJ104	100kΩ	1
	R16	ERDS2TJ151	150Ω	1
	R17	ERDS2TJ103	10kΩ	1
	R18	ERDS2TJ153	15kΩ	1
	R19	ERDS2TJ332	3.3kΩ	1
	R20	ERDS2TJ101	100Ω	1
	R21~27	ERDS2TJ103	10kΩ	7
	R28	ERDS2TJ221	220Ω	1
	R29	ERDS2TJ331	330Ω	1
	R30	ERDS2TJ183	18kΩ	1
	R31	ERDS2TJ332	3.3kΩ	1
	R32	ERDS2TJ103	10kΩ	1
	R33, 34	ERDS2TJ101	100Ω	2
	R39	ERDS2TJ101	100Ω	1

Ref. No.	Part No.	Description	Per/Set
R40	ERDS2TJ154	150kΩ	1
R41	ERDS2TJ103	10kΩ	1
R42 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	1
R43~46	ERDS2TJ473	47kΩ	4
R47	ERDS2TJ184	180kΩ	1
R56	ERDS2TJ472	4.7kΩ	1
R57	ERDS2TJ223	22kΩ	1
R58, 59	ERDS2TJ472	4.7kΩ	2
R60	ERDS2TJ155	1.5MΩ	1
R61	ERDS2TJ473	47kΩ	1
R62	ERDS2TJ681	680Ω	1
R63	ERDS2TJ332	3.3kΩ	1
R64	ERDS2TJ472	4.7kΩ	1
R65	ERDS2TJ105	1MΩ	1
R66	ERDS2TJ104	100kΩ	1
R67, 68	ER0S2CKF1001	1kΩ, ±1%	2
R69	ERDS2TJ103	10kΩ	1
R70, 71 ⚠	ERD2FCVJ4R7	4.7Ω, 1/4W, Fuse Type	4
R72~84	ERDS2TJ101	100Ω	13
CAPACITORS			
C1, 2	ECKR1E473ZV	0.047μF	2
C3	ECRR1H04ZF	0.1μF	1
C4~6	ECKR1E473ZV	0.047μF	3
C7, 8	ECCR1H030C	3pF	2
C9, 10	ECKR1E473ZV	0.047μF	2
C11	ECEA0JKA470	47μF, 6.3V	1
C12	ECEA0JKA331	330μF, 6.3V	1
C13	ECRR1H104ZF	0.1μF	1
C14	ECEA1HKA010	1μF, 50V	1
C15~19	ECKR1E473ZV	0.047μF	5
C20	EECF5R5U105	1F, 5.5V, Memory Back-up	1
C21	ECKR1E473ZV	0.047μF	1
C22	EECF5R5U105	1F, 5.5V, Memory Back-up	1
C23~26	ECKR1E473ZV	0.047μF	4
C27	ECEA0JKA331	330μF, 6.3V	1
C28, 29	ECQG1H102KZ	0.001μF	2
C30~32	ECKR1E473ZV	0.047μF	3
C33	ECCR1H470J	47pF	1
C34	ECCR1H680J	68pF	1
C35~37	ECKR1E473ZV	0.047μF	3
C38	ECQV1H104JZ	0.1μF	1
C39	ECEA1HKA2R2	2.2μF, 50V	1
C40	ECEA0JKA470	47μF, 6.3V	1
C41~44	ECKR1E473ZV	0.047μF	4
C45	ECEA0JKA331	330μF, 6.3V	1
C46	ECCR1H471J	470pF	1
C47, 48	ECCR1H030C	3pF	2
C49, 50	ECEA1CKA100	10μF, 16V	2
C51	ECEA1CKN100	10μF, 16V	1
C52, 53	ECEA1CKA100	10μF, 16V	2
C54	ECKR1E473ZV	0.047μF	1
C55	ECEA0JKA101	100μF, 6.3V	1
C56, 57	ECEA1CKA101	100μF, 16V	2
C58, 59	ECQG1H102KZ	0.001μF	2
C60	ECRR1H104ZF	0.1μF	1
C61, 62	ECQG1H102KZ	0.001μF	2
C63	ECRR1H104ZF	0.1μF	1
C65	ECCR1H331J	330pF	1
C66, 67	ECRR1H104ZF	0.1μF	2
C68	ECCR1H470J	47pF	1
C69, 70	ECKR1E473ZV	0.047μF	2
C71~73	ECRR1H104ZF	0.1μF	3
C74	ECCR1H470J	47pF	1

FDCN FD CONNECTOR CIRCUIT

Ref. No.	Part No.	Description	Per/Set
CONNECTOR			
CN3	SJSG16SM222A	Connector	1
COILS			
L1, 2 M MC XM	QLQGT2T150SA	Coil	2
L3~5 M MC XM	QLQGT3T150SA	Coil	3

DRV DIGITAL REVERB CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	MN1280R	Reset IC	1
IC2	SVIGHM65256	256k bit Pseudo Static RAM	1
IC3	SVIGMB622416	Gate Array	1
IC4	MN8305S	A-D/D-A Converter	1
IC5	SVIG87064073	Digital Signal Processor	1
IC6	SVIGM5278L05	+5V Voltage Regulator	1
IC7	SVIGM5220L	Operational Amplifier	1
IC8~10	SVIGM5218L	Operational Amplifier	3
IC11	SVIGLM1894N	Dynamic Noise Reduction	1
IC12	M74HC02FP	Quad 2-Input NOR Gates	1
TRANSISTORS			
Q1, 2	2SJ105GR	FET	2
DIODES			
D1~5	MA165TA5		5
D6	EK04		1
OSCILLATOR			
X1	SVQGA20MX040	20MHz, Ceramic Oscillator	1
COIL			
L1~3	QLBG002A	Coil	3
L4~6	QLQGT1B600MA	Coil	3
SEMI-FIXED RESISTOR			
VR1	EVND4AA00B14	10kΩ B, DRV Bias	1
RESISTORS			
R1	ERDS2TJ103	10kΩ	1
R2	ERDS2TJ682	6.8kΩ	1
R3, 4	ERDS2TJ473	47kΩ	2
R5	ERDS2TJ393	39kΩ	1
R6, 7	ERDS2TJ103	10kΩ	2
R8	ERDS2TJ473	47kΩ	1
R9	ERDS2TJ152	1.5kΩ	1
R10	ERDS2TJ563	56kΩ	1
R11	ERDS2TJ183	18kΩ	1
R12, 13	ERDS2TJ823	82kΩ	2
R14	ERDS2TJ153	15kΩ	1
R15	ERDS2TJ103	10kΩ	1
R16	ERDS2TJ472	4.7kΩ	1
R17	ERDS2TJ153	15kΩ	1
R18	ERDS2TJ103	10kΩ	1
R19	ERDS2TJ472	4.7kΩ	1
R20	ERDS2TJ682	6.8kΩ	1

	Ref. No.	Part No.	Description	Per/Set
	R21~23	ERDS2TJ473	47kΩ	3
	R24	ERDS2TJ682	6.8kΩ	1
	R25~27	ERDS2TJ473	47kΩ	3
	R36, 37	ERDS2TJ331	330Ω	2
	R38	ERDS2TJ102	1kΩ	1
	R39	ERDS2TJ221	220Ω	1
	R40, 41	ERDS2TJ473	47kΩ	2
	R44, 45	ERDS2TJ472	4.7kΩ	2
	R47	ERDS2TJ221	220Ω	1
	R50~52 ⚠	ERD2FCJ4R7	4.7Ω, 1/4W, Fuse Type	3
	R53, 54 ⚠	ERD2FCG100	10Ω, 1/4W, Fuse Type	2
	R55	ERDS2TJ105	1MΩ	1
	R59	ERDS2TJ221	220Ω	1
	R62~66	ERDS2TJ152	1.5kΩ	5
	R68~70	ERDS2TJ472	4.7kΩ	3
	R71	ERDS2TJ225	2.2MΩ	1
	R72	ERDS2TJ332	3.3kΩ	1
	R73, 74	ERDS2TJ225	2.2MΩ	2
	R75	ERDS2TJ682	6.8kΩ	1
	R76	ERDS2TJ332	3.3kΩ	1
		CAPACITORS		
	C1	ECQB1H103JZ	0.01μF	1
	C2	ECQG1H682KZ	0.0068μF	1
	C3, 4	ECCR1H471J	470pF	2
	C5	ECCR1H101J	100pF	1
	C6	ECEA1HKA010	1μF, 50V	1
	C8	ECEA1HKA010	1μF, 50V	1
	C9	ECQG1H152KZ	0.0015μF	1
	C10	ECCR1H151J	150pF	1
	C11	ECEA1HKA010	1μF, 50V	1
	C12	ECQG1H222KZ	0.0022μF	1
	C13	ECQG1H472KZ	0.0047μF	1
	C14, 15	ECCR1H681J	680pF	2
	C16	ECCR1H101J	100pF	1
	C17	ECEA1HKA010	1μF, 50V	1
	C18	ECQG1H222KZ	0.0022μF	1
	C19	ECQG1H472KZ	0.0047μF	1
	C20, 21	ECCR1H681J	680pF	2
	C22	ECCR1H101J	100pF	1
	C31, 32	ECEA1HKA010	1μF, 50V	2
	C33	ECEA1HKAR22	0.22μF, 50V	1
	C34	ECQB1H103JZ	0.01μF	1
	C35	ECEA1HKAR22	0.22μF, 50V	1
	C36	ECQB1H103JZ	0.01μF	1
	C37	ECQV1H473JZ	0.047μF	1
	C38	ECQV1H104JZ	0.1μF	1
	C39	ECQB1H103JZ	0.01μF	1
	C40	ECQG1H332KZ	0.0033μF	1
	C41	ECEA1CKA470	47μF, 16V	1
	C42	ECEA1CKA100	10μF, 16V	1
	C43	ECEA1CKA470	47μF, 16V	1
	C50~52	ECEA0JKA101	100μF, 6.3V	3
	C53	ECEA0JU102	1000μF, 6.3V	1
	C54	ECEA0JU331	330μF, 6.3V	1
	C55, 56	ECEA1CKA101	100μF, 16V	2
	C57	ECCR1H101J	100pF	1
	C58, 59	ECCR1H060D	6pF	2
	C60	ECKR1E473ZV	0.047μF	1
	C62, 63	ECKR1E473ZV	0.047μF	2
	C65, 66	ECCR1H470J	47pF	2
	C67	ECRR1H104ZF	0.1μF	1
	C68	ECEA1HKN010	1μF, 50V	1
	C69	ECEA1HKA010	1μF, 50V	1
	C72, 73	ECRR1H104ZF	0.1μF	2
	C100, 101	ECRR1H104ZF	0.1μF	2

FAS FILTER & AMP CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
		INTEGRATED CIRCUITS		
	IC1	SVIGM5291P	Switching Regulator	1
	IC2	SVIGM5F7815	+15V Voltage Regulator	1
	IC3	SVIGM5F7915	−15V Voltage Regulator	1
S	IC4, 6, 7, 9, 11~13	SVIGM5218L	Operational Amplifier	7
	IC8	SVIGLM1894N	Dynamic Noise Reduction	1
	IC10	SVIGM5241L	Dual VCA	1
		TRANSISTORS		
	Q1	2SA1643		1
S	Q2~4, 9, 10, 13, 14, 17, 19, 20	2SA1015-GR	2SA933STRS (SUB. Part)	10
S	Q5~8, 11, 12, 15, 16, 18	2SC1815GR		9
○	Q21, 23	2SA15670Y		2
○	Q22, 24	2SC40640Y		2
		DIODES		
	D1~4 ⚠	SVDS2V20	Rectifier	4
	D5, 6 ⚠	SVDGERA1502Y	Rectifier	2
	D7	SVDGRK14S	Diode	1
	D8	MA2062LF	Zener, 6.2V	1
	D9	MA165TA5		1
	D10, 11	EK04		2
		COIL & LINE FILTER		
	L1 ⚠	SLTGLF3	Line Filter	1
○	L2	QLQGT1T121SA	Coil	1
		JACK		
	JK1 ⚠	SJS9236	AC IN, Except for [XR][XL]	1
	JK1 XR XL ⚠	SJSD16	AC IN	1
		SWITCH		
	S1 ⚠	SSRG100A	Voltage Selector	1
		FUSES		
	F1 M XM MC ⚠	XBA1C16NU100	1.6A, 125V	1
	F1 EK X XS XR XD ⚠	XBA2C12TB0	T1.25A, 250V	1
	F2, 3 EK X XS XR XD ⚠	XBA2C063TB0	T630mA, 250V	2
	F3 ⚠	XBA2C063TB0	T630mA, 250V	1
		RESISTORS		
	R1, 2	ERDS2TJ103	10kΩ	2
	R3	ERD2FCVG100	10Ω, 1/4W, Fuse Type	1
	R4 ⚠	ERX1ANJPR22S	0.22Ω, 1W, Flame-Proof	1
	R5	ERDS2TJ101	100Ω	1
	R6	ER0S2CKF1001	1kΩ, ±1%	1
	R7 ⚠	ERG1ANJP221S	220Ω, 1W, Flame-Proof	1
	R8	ER0S2CKF3571	3.57kΩ, ±1%	1
	R9	ERDS2TJ103	10kΩ	1
	R10	ERDS2TJ223	22kΩ	1
	R11	ERDS2TJ101	100Ω	1
	R12	ERDS2TJ333	33kΩ	1
	R13	ERDS2TJ104	100kΩ	1

	Ref. No.	Part No.	Description	Per/Set
	R14, 15	ERDS2TJ103	10kΩ	2
	R16	ERDS2TJ333	33kΩ	1
	R17	ERDS2TJ103	10kΩ	1
	R18	ERDS2TJ224	220kΩ	1
	R19, 20	ERDS2TJ104	100kΩ	2
	R21, 22	ERDS2TJ103	10kΩ	2
	R23	ERDS2TJ474	470kΩ	1
	R24, 25	ERDS2TJ124	120kΩ	2
	R26	ERDS2TJ332	3.3kΩ	1
	R27	ERDS2TJ153	15kΩ	1
	R28	ERDS2TJ683	68kΩ	1
	R31	ERDS2TJ154	150kΩ	1
	R32	ERDS2TJ683	68kΩ	1
	R33	ERDS2TJ473	47kΩ	1
	R34	ERDS2TJ393	39kΩ	1
	R35	ERDS2TJ333	33kΩ	1
	R36	ERDS2TJ473	47kΩ	1
	R37	ERDS2TJ333	33kΩ	1
	R38	ERDS2TJ393	39kΩ	1
	R39	ERDS2TJ473	47kΩ	1
	R40	ERDS2TJ683	68kΩ	1
	R41	ERDS2TJ154	150kΩ	1
	R42	ERDS2TJ473	47kΩ	1
	R43, 44	ERDS2TJ273	27kΩ	2
	R45	ERDS2TJ123	12kΩ	1
	R47~51	ERDS2TJ393	39kΩ	5
	R52	ERDS2TJ472	4.7kΩ	1
	R53	ERDS2TJ102	1kΩ	1
	R54	ERDS2TJ124	120kΩ	1
	R55, 56 ⚠	ERG1ANJP680S	68Ω, 1W, Flame-Proof	2
	R57	ERDS2TJ473	47kΩ	1
	R58	ERDS2TJ224	220kΩ	1
	R59	ERDS2TJ473	47kΩ	1
	R60	ERDS2TJ224	220kΩ	1
	R61~64	ERDS2TJ154	150kΩ	4
	R65, 66	ERDS2TJ472	4.7kΩ	2
	R67	ERDS2TJ222	2.2kΩ	1
	R68, 69	ERDS2TJ472	4.7kΩ	2
	R70	ERDS2TJ222	2.2kΩ	1
	R71~76	ERDS2TJ333	33kΩ	6
	R77, 78	ERDS2TJ472	4.7kΩ	2
	R79~81	ERDS2TJ331	330Ω	3
	R82	ERDS2TJ681	680Ω	1
	R83, 84	ERDS2TJ223	22kΩ	2
	R85	ERDS2TJ152	1.5kΩ	1
	R86, 87	ERDS2TJ104	100kΩ	2
	R88, 89	ERDS2TJ103	10kΩ	2
	R90, 91	ERDS2TJ124	120kΩ	2
	R92, 93	ERDS2TJ104	100kΩ	2
	R94, 95	ERDS2TJ223	22kΩ	2
	R96, 97	ERDS2TJ332	3.3kΩ	2
	R99, 100	ERDS2TJ102	1kΩ	2
	R102	ERDS2TJ272	2.7kΩ	1
	R103	ERDS2TJ222	2.2kΩ	1
	R104	ERDS2TJ473	47kΩ	1
	R105	ERDS2TJ223	22kΩ	1
	R106	ERDS2TJ682	6.8kΩ	1
	R107	ERDS2TJ102	1kΩ	1
	R108	ERDS2TJ153	15kΩ	1
	R109	ERDS2TJ331	330Ω	1
	R110	ERDS2TJ102	1kΩ	1
	R111	ERDS2TJ682	6.8kΩ	1
	R112	ERDS2TJ331	330Ω	1
	R113	ERDS2TJ153	15kΩ	1
	R114~117	ERDS2TJ471	470Ω	4
	R118, 119	ERDS2TJ102	1kΩ	2
	R120 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
	R121	ERDS2TJ272	2.7kΩ	1
	R122	ERDS2TJ473	47kΩ	1
	R123	ERDS2TJ223	22kΩ	1
	R124	ERDS2TJ222	2.2kΩ	1
	R125	ERDS2TJ682	6.8kΩ	1
	R126	ERDS2TJ102	1kΩ	1
	R127	ERDS2TJ153	15kΩ	1
	R128	ERDS2TJ331	330Ω	1
	R129	ERDS2TJ102	1kΩ	1
	R130	ERDS2TJ682	6.8kΩ	1
	R131	ERDS2TJ331	330Ω	1
	R132	ERDS2TJ153	15kΩ	1
	R133~136	ERDS2TJ471	470Ω	4
	R137, 138	ERDS2TJ102	1kΩ	2
	R139 ⚠	ERD25FVJ4R7	4.7Ω, 1/4W, Flame-Proof	1
	R140	ERDS2TJ184	180kΩ	1
	R143	ERDS2TJ184	180kΩ	1
	R144, 145	ERDS2TJ224	220kΩ	2
	R146, 147	ERDS2TJ220	22Ω	2
	R152	ERDS2TJ472	4.7kΩ	1
	R153	ERDS2TJ102	1kΩ	1
	R154	ERDS2TJ104	100kΩ	1
	R155	ERD2FCVG100	10Ω, 1/4W, Fuse Type	1
			CAPACITORS	
	C1 ⚠	ECKCVA1472MF	4700pF, Line-Capacitor	1
○	C2 ⚠	ECQU2A224MN	0.22µF, 250V, Across-the Line Capacitor	1
	C3	ECEA1VU222	2200µF, 35V	1
	C4	ECEA1VU332	3300µF, 35V	1
	C5	ECEA1VKA470	47µF, 35V	1
	C6	ECCR1H471J	470pF	1
	C7, 8	ECEA1VKA100	10µF, 35V	2
	C9	ECEA0JU102	1000µF, 6.3V	1
	C10	ECKR1E473ZV	0.047µF	1
	C11	ECCR1H101J	100pF	1
	C12	ECEA1CKA101	100µF, 16V	1
	C13	ECQV1H104JZ	0.1µF	1
	C14	ECQM1H223KV	0.022µF	1
	C15, 16	ECQG1H222KZ	0.0022µF	2
	C19	ECCR1H680J	68pF	1
	C20	ECQV1H104JZ	0.1µF	1
	C21	ECEA1CKA100	10µF, 16V	1
	C22	ECQG1H102KZ	0.001µF	1
	C23	ECCR1H220J	22pF	1
	C24	ECQG1H102KZ	0.001µF	1
	C25	ECCR1H220J	22pF	1
	C26, 27	ECQG1H102KZ	0.001µF	2
	C28	ECQG1H222KZ	0.0022µF	1
	C29, 30	ECQG1H102KZ	0.001µF	2
	C31	ECQG1H222KZ	0.0022µF	1
	C32, 33	ECCR1H471J	470pF	2
	C34	ECCR1H680J	68pF	1
	C35, 36	ECCR1H471J	470pF	2
	C37	ECCR1H680J	68pF	1
	C38, 39	ECEA1CKA470	47µF, 16V	2
	C40, 41	ECEA1HKA010	1µF, 50V	2
	C42	ECQV1H104JZ	0.1µF	1
	C43	ECQG1H102KZ	0.001µF	1
	C44	ECQG1H332KZ	0.0033µF	1
	C45	ECQM1H473KV	0.047µF	1
	C46	ECQG1H472KZ	0.0047µF	2
	C47	ECEA1CKA100	10µF, 16V	1
	C48	ECQG1H472KZ	0.0047µF	1
	C49, 50	ECEA1HKA010	1µF, 50V	2
	C51, 52	ECCR1H470J	47pF	2
	C53~55	ECEA1HKN010	1µF, 50V	3
	C56	ECCR1H101J	100pF	1

Ref. No.	Part No.	Description	Per/Set
C57	ECQM1H473KV	0.047µF	1
C58	ECQV1H104JZ	0.1µF	1
C59	ECEA1HKN010	1µF, 50V	1
C60	ECCR1H101J	100pF	1
C61	ECQM1H473KV	0.047µF	1
C62	ECQV1H104JZ	0.1µF	1
C63, 64	ECCR1H220J	22pF	2
C65, 66	ECEA50Y1	1µF, 50V	2
C67~74	ECQG1H472KZ	0.0047µF	8
C75~77	ECEA1CKA470	47µF, 16V	3
C79	ECEA1CU331	330µF, 16V	1
C80, 81	ECRR1H104ZF	0.1µF	2
C82	ECKR1E473ZV	0.047µF	1

HB HEADPHONES CIRCUIT

Ref. No.	Part No.	Description	Per/Set
COIL			
L1	QLQGT3T150SA	Coil	1
JACK			
JK1	SJJG100A	Headphones	1
VARIABLE RESISTORS			
VR1	EVA07115B14G	10kΩ B, MODULATION	1
VR2	EVA07015B54G	50kΩ B, PITCH BEND	1
RESISTORS			
R3, 4	ER0S2CKF1001	1kΩ, ±1%	2
CAPACITORS			
C1, 2	ECCR1H331J	330pF	2
C3	ECRR1H104ZF	0.1µF	1

CPL UPPER CONTROL PANEL LEFT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
D73~80, 85~88, 217~224	MA165TA5		20
D173~180, 185~187	SEL4117RM	LED (RED)	11
SWITCHES			
S73~80, 85~88, 217~224	SSHG1049A	Push Switch	20
RESISTORS			
R38~40	ERDS2TJ470	47Ω	3

CPR UPPER CONTROL PANEL RIGHT CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGM603A121	Gate Array	1
IC2	SVIGM74LS139	Decoder	1
IC3	SVIGM74LS74	Dual D-type Flip-Flops	1
IC4~7	SVIGM74LS07	Hex Buffers (O.C.)	4
TRANSISTORS			
Q1	2SC1815GR		1
Q2~5	2SA830SB		4
DIODES			
D1~72, 81~84, 89, 90, 201~216	MA165TA5		94
D101~116, 118~124, 145, 147~155, 157~161, 166~172, 181~183	SEL4117RM	LED (RED)	48
D117, 125~132, 156, 162~165, 184	SEL4417GM	LED (GREEN)	15
○ D133~144	SEL4417G	LED (Green)	12
COMPONENT COMBINATION			
Z1	EXBPI8103JM	10kΩ×8	1
SWITCHES			
S1~72, 81~84, 201~216	SSHG1049A	Push Switch	92
IC PROTECTOR			
IP1	ICP-N10T104	IC Protector	1
VARIABLE RESISTORS			
○ VR1	QRVG15N01B14	10kΩ B, LCD Contrast	1
VR2	EVD07205B24G	20kΩ B, MAIN VOLUME	1
RESISTORS			
R1	ERDS2TJ222	2.2kΩ	1
R2	ERDS2TJ103	10kΩ	1
R3	ERDS2TJ474	470kΩ	1
R4	ERDS2TJ334	330kΩ	1
R5	ERDS2TJ154	150kΩ	1
R6	ERDS2TJ184	180kΩ	1
R7	ERDS2TJ224	220kΩ	1
R8	ERDS2TJ103	10kΩ	1
R9	ERDS2TJ152	1.5kΩ	1
R10	ERDS2TJ101	100Ω	1
R11~14	ERDS2TJ103	10kΩ	1
R15~18	ERDS2TJ152	1.5kΩ	4
R19~37	ERDS2TJ470	47Ω	19

Ref. No.	Part No.	Description	Per/Set
CAPACITORS			
C1	ECEA1HKA2R2	2.2µF, 50V	1
C2	ECRR1H104ZF	0.1µF	1
C3	ECEA0JKA101	100µF, 6.3V	1
C4	ECCR1H101J	100pF	1
C5	ECEA1HKA010	1µF, 50V	1
C6	ECCR1H101J	100pF	1
C7~11	ECRR1H104ZF	0.1µF	5

ESW ENCODER SWITCH

Ref. No.	Part No.	Description	Per/Set
SWITCH			
S1	SSRG110A	Encoder Switch	1

MKB1 MANUAL KEYBOARD 1 CIRCUIT

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUIT			
IC1	MN50020PGV	Gate Array	1
DIODES			
S D1~87	MA162A	MA150IR (SUB. Part)	87
OSCILLATOR			
X1	EF0GC8004A5	8MHz, Ceramic Oscillator	1
SWITCHES			
S1~7	SSPG7004A	Rubber Switch (7 pcs. on one)	1
S8~43	SSPG6004A	Rubber Switch (6 pcs. on one)	6
RESISTORS			
R1	ERDS2TJ101	100Ω	1
R2	ERDS2TJ103	10kΩ	1
CAPACITORS			
C1	ECCR1H681J	680pF	1
C2	ECRR1H104ZF	0.1µF	1
C3	ECCR1H681J	680pF	1
C4	ECEA0JU470	47µF, 6.3V	1

MKB2 MANUAL KEYBOARD 2 CIRCUIT

Ref. No.	Part No.	Description	Per/Set
DIODES			
S D1~36	MA162A	MA150IR (SUB. Part)	36
COMPONENT COMBINATION			
Z1	EXBP88332JM	3.3kΩ×8	1

Ref. No.	Part No.	Description	Per/Set
SWITCHES			
S1~18	SSPG6004A	Rubber Switch (6 pcs. on one)	3

FDC FD CONTROL CIRCUIT

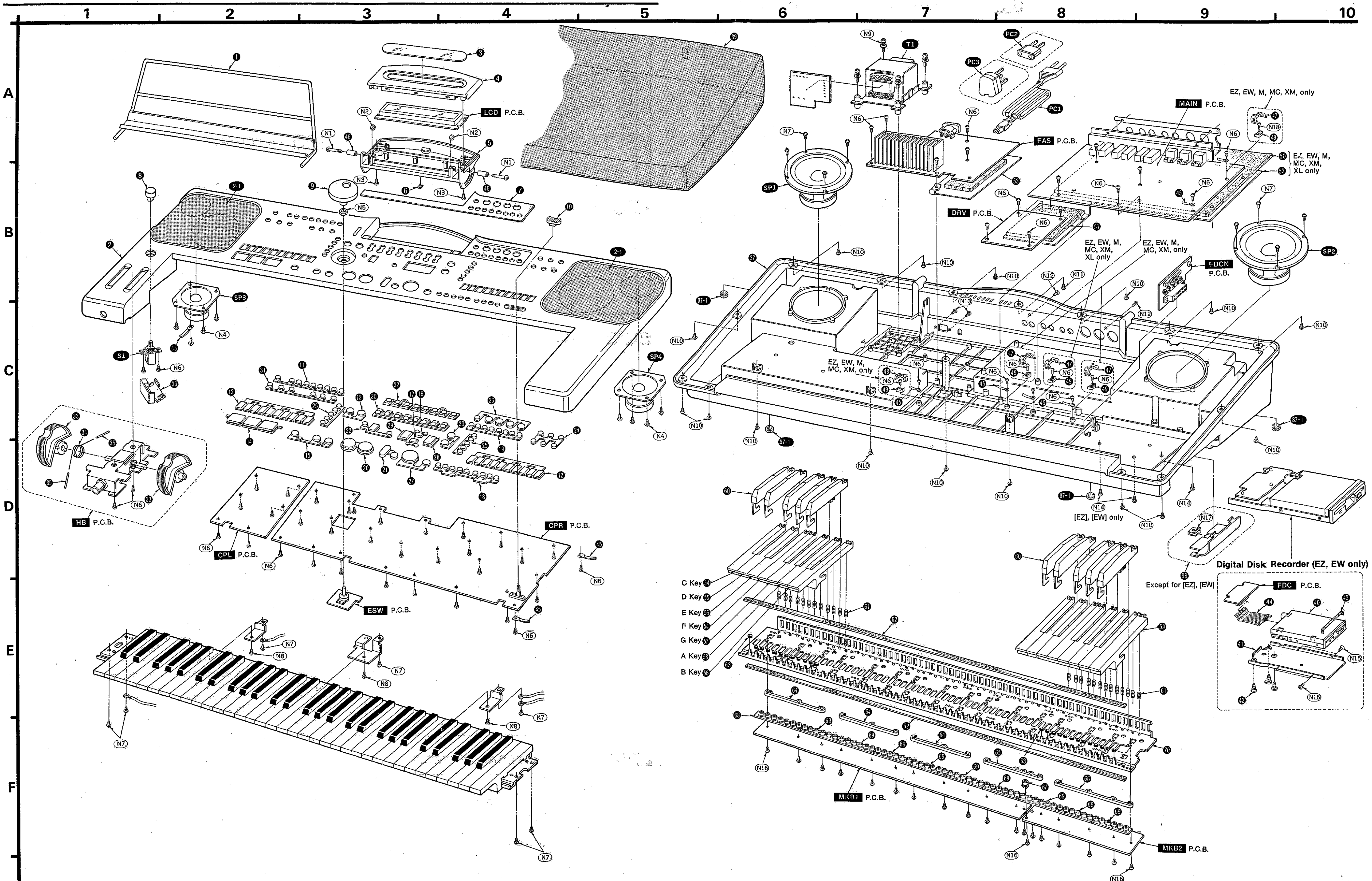
([EZ][EW] only)

Ref. No.	Part No.	Description	Per/Set
INTEGRATED CIRCUITS			
IC1	SVIGD72067C	Floppy Disk Controller	1
IC2	SVIGM74H02	Quad 2-input NOR Gates	1
IC3	SVIGM74H00	Quad 2-input NAND Gates	1
IC4	SVIGM74H14	Hex Schmitt-trigger Inverters	1
IC5	SVIGM74H04	Hex Inverters	1
OSCILLATOR			
○ X1	QSXG1A3200A	32MHz, Quartz Oscillator	1
COMPONENT COMBINATIONS			
Z1, 2	EXBPI8103JM	10kΩ×8	2
Z3	EXBPI8102JM	1kΩ×8	1
RESISTORS			
R1~4	ERDS2TJ472	4.7kΩ	4
R5, 6	ERDS2TJ153	15kΩ	2
R7	ERDS2TJ103	10kΩ	1
CAPACITORS			
C1, 2	ECBA1H100J	10pF	2
C6	ECEA0JKA331	330µF, 6.3V	1
C8~11	ECRR1H104ZF	0.1µF	4
C12	ECBA1H100J	10pF	1

■ WIRING PARTS

Ref. No.	Part No.	Description	Per/Set
W1	SWKG1518SSA	Connector with Wire	1
W2	SWKG04116SSA	Connector with Wire	1
○ W3	QEXG021012ZA	Connector with Wire	1
○ W4	QEXG06015ZB	Connector with Wire	1
W5	SWKG04140SSA	Connector with Wire	1
○ W6	QEXG05020SSA	Connector with Wire	1
W7	SWKG0237ZA	Connector with Wire	1
○ W8	QEXG04037ZA	Connector with Wire	1
○ W9	QEXG03039ZA	Connector with Wire	1
○ W10	GEXG03042SSA	Connector with Wire	1
○ W11	QEXG14013SSA	Connector with Wire	1
W12	SWKG1337SSA	Connector with Wire	1
W13	SWKG1350SSA	Connector with Wire	1
W14	SWKG0712SSA	Connector with Wire	1
○ W15	QEXG01012ZA	Connector with Wire	1
W16	SWKG06137SSB	Connector with Wire	1
W17	SWKG164SSA	Connector with Wire	1
○ W18	QEXG10008SSA	Connector with Wire	1
○ W19	QEXG11011SSA	Connector with Wire	1

EXPLODED VIEWS OF CABINET


1
2
3
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9
10
A
B
C
D
E
F
LCD P.C.B.
S1
SP3
SP4
HB P.C.B.
CPL P.C.B.
CPR P.C.B.
ESW P.C.B.
T1
PC1
PC2
PC3
FAS P.C.B.
MAIN P.C.B.
DRV P.C.B.
FDCN P.C.B.
SP1
SP2
EZ, EW, M, MC, XM, only
EZ, EW, M, MC, XM, XL only
EZ, EW, M, MC, XM, XL only
EZ, EW, M, MC, XM, only
EZ, EW, M, MC, XM, only
[EZ], [EW] only
Except for [EZ], [EW]
Digital Disk Recorder (EZ, EW only)
FDC P.C.B.
C Key
D Key
E Key
F Key
G Key
A Key
B Key
MKB1 P.C.B.
MKB2 P.C.B.
37-1
2-1
N1
N2
N3
N4
N5
N6
N7
N8
N9
N10
N11
N12
N13
N14
N15
N16
N17
N18

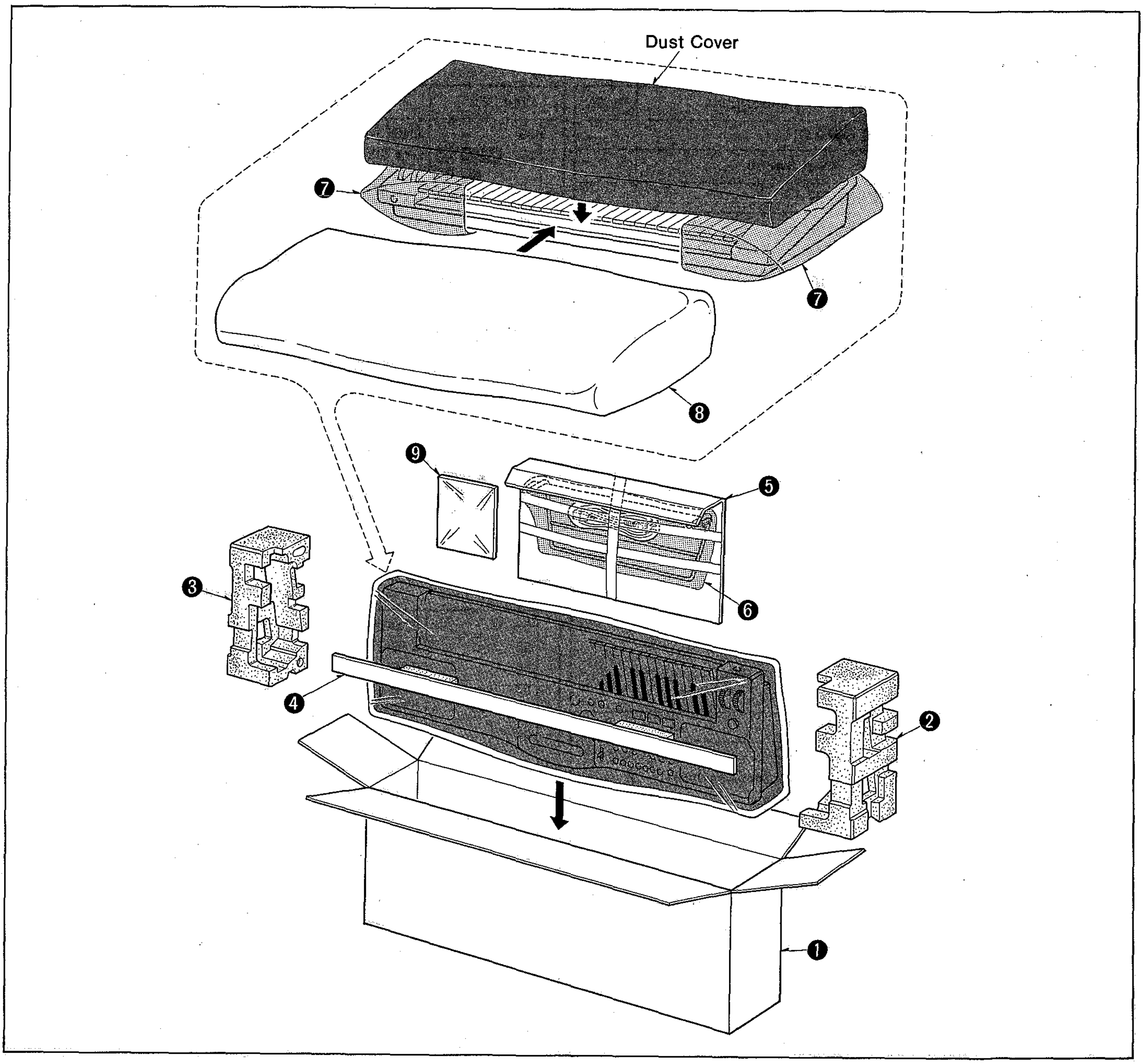
REPLACEMENT PARTS LIST......Cabinet and Chassis Parts

Note: Keyboard chassis part No. with mark (NLA) is no longer available after production discontinuation of the complete set.

■ CABINET & CHASSIS PARTS

Ref. No.	Part No.	Description	Per/Set
POWER SWITCH			
S1 ⚠	ESB823V	Power Switch	1
SPEAKERS			
SP1, 2	SASG12PL03-F	12cm, 8Ω	2
SP3, 4	EAS65PH89A	Speaker 6.5cm, 12Ω	2
TRANSFORMER			
○ T1 EN EP EF EZ EA ⚠	QTPG1M005A	Power Transformer	1
○ T1 M MC EK X XS XR ⚠	QTPG1M007A	Power Transformer	1
POWER CORD & PLUG			
○ PC1 EK XS XD ⚠	QJAG001AA	AC Power Cord	1
PC1 EH ⚠	SJAG41	AC Power Cord	1
PC1 XL XR ⚠	SJAG61	AC Power Cord	1
PC1 M MC XM ⚠	SJAG62	AC Power Cord	1
PC1 EN EZ EF EP EA ⚠	SJAG65	AC Power Cord	1
PC2 X ⚠	SJP5213-1	Attachment Plug	1
PC3 XD ⚠	SJPG1350A	Power Plug	1
CABINET PARTS			
○ 1	QYAG3002AA	Music Rack	1
○ 2	QYPG1014AB	Control Panel Assembly	1
○ 2-1	[QGMG0006AA	Speaker Net	2
○ 3	QGPG0028AA	Transparent Plate	1
○ 4	QGPG0026AB	LCD Case	1
○ 5	QGPG0027AB	LCD Base	1
○ 6	QMGG014AA	Cushion	1
○ 7	QGPG0029AA	Sequencer Indication Plate	1
8	SBCG1660A	Button, Power Switch	1
○ 9	QGUG3002AA	Dial Wheel	1
10	SBNG7070A	Knob, Main Volume	1
○ 11	QGUG1077AA	Button	1
○ 12	QGUG1078AA	Button	2
○ 13	QGUG1079AA01	Button	1
○ 14	QGUG1080AA01	Button	1
○ 15	QGUG1081AA01	Button	1
○ 16	QGUG1082AA01	Button	1
○ 17	QGUG1082AA02	Button	1
○ 18	QGUG1083AA	Button	1
○ 19	QGUG1084AA	Button	1
○ 20	QGUG1085AA	Button	1
○ 21	QGUG1086AA	Button	1
○ 22	QGUG1087AA	Button	1
○ 23	QGUG1088AA01	Button	1
○ 24	QGUG1089AA	Button	1
○ 25	QGUG1092AA	Button	2
○ 26	QGUG1095AA	Button	1
○ 27	QGUG1096AA	Button	1
○ 28	QGUG1097AA01	Button	1
○ 29	QGUG1097AA02	Button	1
○ 30	QGUG1098AA01	Button	1
○ 31	QGUG1099AA	Button	1
○ 32	QGUG1100AA01	Button	1
33	SBNG4050A	Wheel Knob	2
34	SUSG570A	Spring	1
35	SHGG5010A	Tube	2
36	SHRG8390A	Cover, Power SW.	1
○ 37 EK X XS XR XD	QYKG050AA	Bottom Plate	1
○ 37 Others	QYKG050BB	Bottom Plate	1
37-1	[SHGG3130A	Foot Rubber	4
○ 38	QYKG051AA	DDR Cover	1
○ 39	SQCG402A	Dust Cover	1
○ 40	EME213DV	Digital Disk Drive Unit	1
○ 41	SUVG1282A	Cover	1
42 EZ EW	SHRG9850A	P.C.B. Holder	3
○ 43	QMFG1066AA	Felt	1
○ 44	QEUGR0W10A	Flat Cable	1
45	TUX926	Binder	(9)
○ 46	QMXG003AA	Spacer	2
47	QLZG001A	Core	4
48	SLQGTRCC20	Core	1
49 EZ EW	SHRG1270A	Mounting Base	5
○ 50 M MC	QMRG5012AA	Cushion	1
○ 51 XM XL	QMRG5013AA	Cushion	1
○ 52	QSCG033A	Shield parts	1
○ 53	QSCG032A	Shield Parts	1
MANUAL KEYBOARD			
54	STBG1100A	White Key (C and F Key)	10
55	STBG1110A	White Key (D Key)	5
56	STBG1120A	White Key (E and B Key)	10
57	STBG1130A	White Key (G Key)	5
58	STBG1140A	White Key (A Key)	5
59	STBG1150A	White Key (Top Octave C Key)	1
60	STBG2070A	Black Key	25
61	SUSG270A	Spring	61
62	SHSG1970A	Felt	2
63	SHGG9050A	Key Guide Rubber	61
64	SHRGA9010A	Spacer	3
65	SHRGA9020A	Spacer	1
66	SHRGA9030A	Spacer	1
67	SHRG9760A	Spacer	1
68	SSPG7004A	Rubber Switch (7 pcs. on one)	1
69	SSPG6004A	Rubber Switch (6 pcs. on one)	9
70 (NLA)	STBG6241A	Chassis	1
SCREWS & WASHERS			
○ N1	XSB4+25	Screw	2
N2	XNG4B	Nut	2
N3	XTV3+12BFZ	Screw	2
N4	XTW3+10Q	Screw	8
N5	XNS9	Nut	1
N6	XTV3+10G	Screw	55
N7	XTW3+12Q	Screw	15
N8	XTB3+5C	Screw	3
N9	QHDG002AA	Screw with Washer	4
N10	XTW3+14TFZ	Screw	16
N11	XTW3+10QFVC	Screw	1
N12	XTB3+10JFZ	Screw	2
N13	XTB3+14GFZ	Screw	2
N14	XTB4+8FFZ	Screw	1
N14 EZ EW	XTB4+8FFZ	Screw	2
N15 EZ EW	XSS3+6FZ	Screw	4
N16	XTW3+10T	Screw	19
N17	SNEG2620A	Nut	1
N18	XTB3+12BFZ	Screw	1

PACKING



■ PACKING PARTS

Ref. No.	Part No.	Description	Per/Set
○ 1	QPGG0093AA	Carton	1
○ 1 EZ EW	QPGG0093AB	Carton	1
○ 2	QPNG0183AA	Pad	1
○ 3	QPNG0184AA	Pad	1
○ 4	QPNG0185AA	Pad	1
○ 5	QPNG0186AA	Cardboard	1
6	SPHG1770A	Polyethylene Bag	1
7	QPHG007AA	Polyethylene Bag	2
8	QPFG002AA	Polyethylene Bag	1

Ref. No.	Part No.	Description	Per/Set
INSTRUCTION BOOK			
○ 9 EN	QQFGKN1000AA	Instruction Book	1
○ 9 M	QQFGKN1000CA	Instruction Book	1
○ 9 MC	QQFGKN1000DA	Instruction Book	1
○ 9 EZ EA	QQFGKN1000EA	Instruction Book	1
○ 9 EF	QQFGKN1000FA	Instruction Book	1
○ 9 EW	QQFGKN1000GA	Instruction Book	1
○ 9 EH	QQFGKN1000HA	Instruction Book	1
○ 9 X	QQFGKN1000JA	Instruction Book	1
○ 9 EK XL XR XS XD	QQFGKN1000KA	Instruction Book	1
○ 9 EP XM	QQFGKN1000LA	Instruction Book	1